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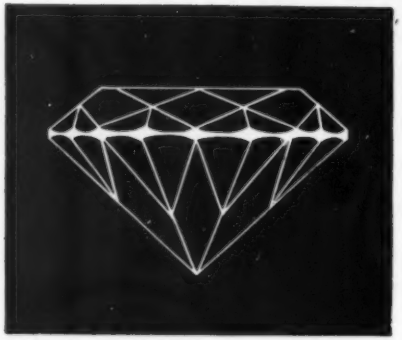

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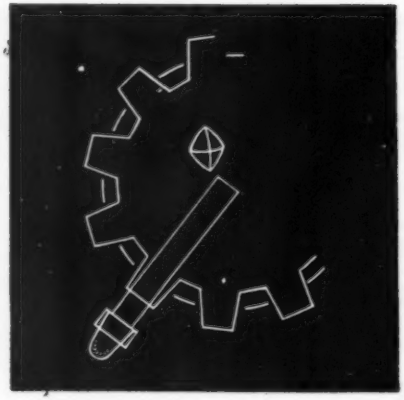

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INDUSTRIAL DIAMOND REVIEW

Vol 21 No 251
October 1961

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Generally Speaking

Conference at Manchester

Manchester College of Science and Technology was the scene of the second Machine Tool Design and Research Conference, from September 25 to 30. The attendance was more than double that at the first conference, held last year at Birmingham, a change which follows the trend observable in the similar conferences held at various places on the Continent, especially those which have taken place at Aachen. The Manchester meeting was deliberately designed to be similar in intention to these conferences, and many of the best known continental experts were invited. Amongst those who were present was Prof. H. Opitz, well-known to IDR readers from the articles that have appeared under his name.

From an industrial diamond point of view the conference was disappointing, as the subject was hardly mentioned, and certainly no detailed consideration was given to the many sides of this matter that could have formed a useful part of the conference.

De Beers Synthetic Diamonds

Our readers will no doubt have seen the reports in the lay Press of the official opening of the De Beers' synthetic diamond factory at Springs, South Africa. A fuller report of the occasion will be found on the following pages with some of the speeches, giving the background to this new venture in detail.

U.S. or Europe?

It is often taken for granted that the U.S. are the leaders in any industrial advances, and their far greater use of diamond tooling is sometimes cited as evidence for this. We frequently doubt if this view is entirely true, and several cases have come to our notice recently where Europe was ahead of the States in techniques. Where they do seem to have the advantage is in the speed with which advances are adopted generally in industry; once introduced, a new technique will be universally adopted very quickly, a marked contrast with what generally seems to happen on this side of the Atlantic.

ADAMANT.

De Beers Synthetic Diamond Plant

Factory at Springs goes into Production

The Opening Ceremony for the new De Beers Synthetic Diamond Plant at Springs near Johannesburg, South Africa, was performed on Friday, October 13, the actual ceremony being performed by Mrs. H. F. Oppenheimer. Mr. Oppenheimer addressed the visitors and said :

'I extend a special welcome to Governor A. Moeller de Laddersous who has come from Brussels to be present at this function. He represents the Minière du Bécéka who are our partners in this venture. They are the producers, from their Mines at Bakwanga in the Congo, of the vast majority of natural diamond abrasive, and their output has for many years been marketed through our organisation. Both we and our friends in the B.C.K. Company see great advantages in our selling organisation being in a position to supply both natural and synthetic grit, especially at the present time. The disturbed conditions in the Congo have naturally caused some anxiety about the security of the supply of diamonds from Bakwanga. And here, may I express to Governor Moeller, not only in his capacity as a Director of the B.C.K. Company, but as a former Governor of the Oriental Province of the Congo, our sympathy in the deplorable events in that country, and our hope that the peace and order and prosperity that were established and maintained there for so many years by Belgium will soon be restored. Throughout the disturbances of which Bakwanga was the centre, production of diamonds was continued owing to the courage and devotion of M. Cravatte and other officials of the B.C.K. Company, with only short interruption, and at present I'm glad to say that production is running at a high level. Obviously, our objective in starting this factory is not to compete with the natural product, but if by some misfortune supplies from the Congo were to be interrupted, we would be in a position to supply our customers with an effective substitute, though one which over a large part of the field is not as efficient as the natural diamond product. In certain applications, however, synthetic diamond grit is as good or better than natural grit, and in this sector of the market we shall compete actively with the synthetic material being manufactured by others ; and we are fully satisfied that the quality of our product is at least as good as the material that is being marketed by our competitors.

A general view of the hall in which 75 ultra high pressure units are mounted.

The most important advantage of our synthetic production, however, is not in the competitive position—in a narrow sense—which it provides, but because it may, and I believe will, make possible over a period a large increase in the use of diamond grit (natural and synthetic together) in industry. Before General Electric's discovery, the use of diamond abrasives was limited by the supply ; research and development work to find new uses were inhibited because, if they were successful we would have been unable to guarantee adequate and continuous supplies. The production of synthetic diamond grit first by General Electric and now by ourselves has changed the situation completely. New uses for diamonds in industry are being, and will continue to be, actively explored, and I have little doubt that the result will be a large increase in consumption to our benefit and to the benefit of our customers. As I see it, therefore, the direct advantage of this new plant which is being officially opened this morning is that it will enable the De Beers Company and its partners to share fully in these opportunities for development and progress.'

The general description of the plant and its operation was then given by Dr. Custers, the Director of Research of the Adamant Research Laboratory, which was responsible for the development of the process which is being used in the new factory. He said that he was sure

that many of the visitors would be interested to know how the method was carried out. It was, he said, done by the 75 production units which they could see in the hall, each one of which consisted of a 500 ton fully automatic hydraulic press. Each press had associated with it electrical equipment to provide the power necessary for the production of the very high temperature at which the synthesis process took place. Each press contained a small pressure chamber holding the starting material in the form of a metal solvent and a carbonaceous substance which was submitted to extremely high temperatures and pressures. Dr. Custers then went on to draw a very vivid analogy between the pressure produced in the chamber and that which would occur were the Eiffel Tower to be inverted and made to rest with its top on the edge of a cube with 3 in. sides. The gravitational force of this mass of steel (some 7,000 tons) pressing on the cube would produce an internal pressure of the same order of magnitude as that required for the diamond synthesis, somewhere around 100,000 atmospheres. Dr. Custers said that the process was fully automatic and that the production cycle took only about 10 minutes. He went on to say that many of those present would probably remember the first batch of De Beers synthetic diamonds that were shown in 1959 and to point out that they had the opportunity of seeing the tremendous progress which had been made in the intervening time. Samples of the grit which had been manufactured in the room where they were then assembled were being shown and the factory was in a position to produce various types of grits for the different applications of diamond abrasives, of which the impregnated grinding wheel was the most important. Dr. Custers continued by describing the control of the process that was exercised by the Adamant Laboratory and said that their methods of inspection would ensure not only a consistent and efficient quality, but that improvements would follow.

The decision made in 1946 by the late Sir Ernest Oppenheimer to build the Diamond Research Laboratory was part of the policy necessary to every modern industry, that it should have the backing of an efficient laboratory. The Diamond Research Laboratory would continue to concentrate on research in natural diamonds, whilst the Adamant Research Laboratory, ten years younger, would devote its efforts to perfecting the synthetic type.

The decision of the De Beers concern to enter into the large-scale production of synthetic diamonds can be considered in the light of an insurance policy to avoid the risk of shortage of supplies if some of the natural sources should be cut off owing to political disturbances, and to ensure that the Group, which has been known for so many years as the leaders of the diamond world should not fall behind in a branch of that activity.

Reprint Service

A new edition of the ' Industrial Diamond Information Bureau Reprint Service ' is now available free on request. It includes the titles of all the reprints that are now held and supersedes the 1958 edition.

For Your Information

Two new booklets, ' The Diamond Research Laboratory ' and ' Diamonds in Industry, ' have been published by the Industrial Diamond Information Bureau.

' The Diamond Research Laboratory ' outlines the aims of the Laboratory ; then describes the functions of its various sections, viz : Physics, Chemical, Grinding Wheel Testing, Drilling, and Metallurgical sections.

' Diamonds in Industry ' is intended as an introduction to the subject. It describes in simple terms, with the help of illustrations, the major applications of diamonds in industry and also mentions some of the new applications that have been discovered at the Diamond Research Laboratory.

Both these publications are printed in English, French, and German, and are available free on request from : Industrial Diamond Information Bureau, 2 Charterhouse Street, London E.C.1. Dutch and Italian versions will be available shortly.

Production Turning of Commutators with Diamond Tools

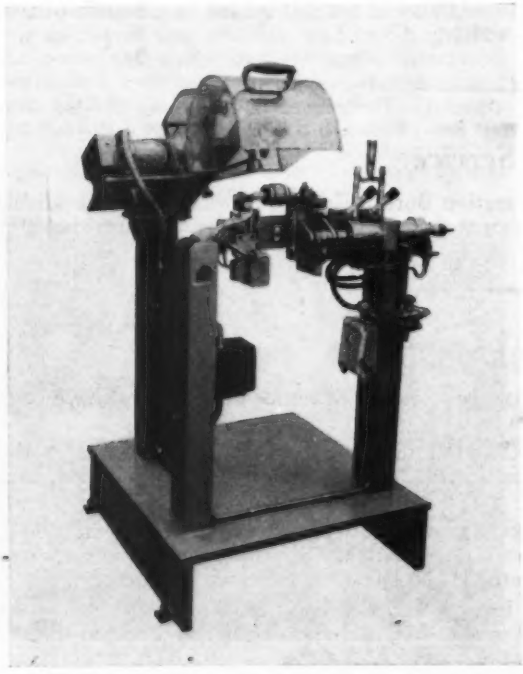
Experience has shown that diamond tools are the most efficient and economic media for the production turning of electric motor commutators.

The method at present used by most of the leading British and foreign producers of small electric motors was devised in 1954 by Small Electric Motors Ltd., Eagle Works, Beckenham, Kent.

This company developed a special lathe for the production turning of armature commutators and with the use of semi-skilled labour reached a rate of over 200 finish-turned units an hour. It was not, however, until engineers from another firm, seeing the lathe in operation for the first time, mentioned the need for such a machine in industry, that it was manufactured for sale. One of the original lathes is shown in Figure 1.

Full-scale production started in 1955 and, to date, over 100 have been built, many of them exported to almost every major manufacturing country in the world.

Fig. 1. One of the original S.E.M. commutator lathes.



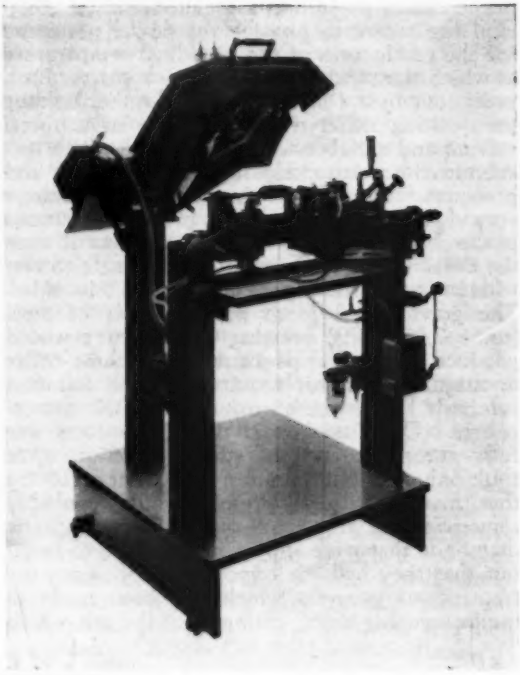


Fig. 2. The newest S.E.M. lathe, the Mk. II.

For five years only minor improvements were incorporated in the design, but about seven months ago work started on a Mk. II (Fig. 2). Many of the new features incorporated in this improved model, which include better lubrication for journal bearings; a metal guard and air-operated safety catch and a completely new and more rigid tool post (Fig. 3), giving greater adjustment of depth of cut and longer diamond life, are based on suggestions from Joseph Lucas Ltd, and Hoover Ltd, the largest users of the lathes. The first model of this new Mark has now been completed and exported to the United States.

The S.E.M. lathe is unique for several reasons; its design is unconventional and comprises a base of 1 in. boiler plate mounted on two side plates fitted with levelling screws. The lathe bed and driving motor are supported on three girder-section uprights, welded to the base plate. The

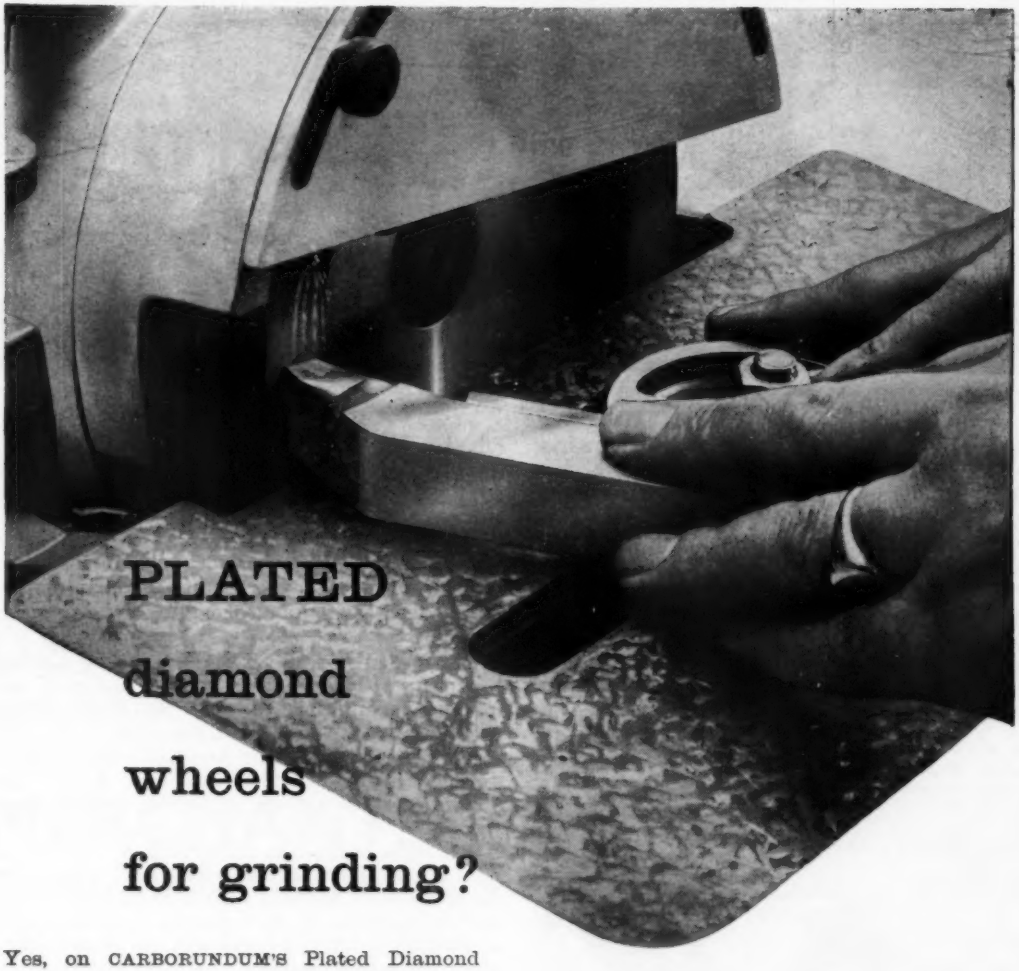


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Fig. 3. A close-up of the new and more rigid tool-post on the Mk. II S.E.M. commutator lathe.

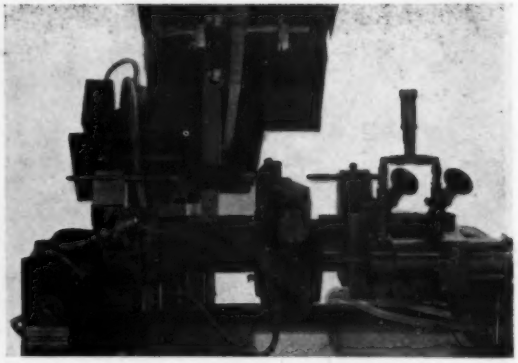

Fig. 5. Close-up of cover and driving belt over the armature.

cast-iron lathe bed, hand-scraped to reduce wear—which would result from abrasive dust left embedded in a ground bed, carries the vee blocks in which the armature spindle rests for the actual turning operation and the tool slide and slide-driving cylinder (Fig 4).

The armature is driven or rotated by a fabric belt taken round the motor pulley and over jockey pulleys; the belt runs on the top of the armature causing it to rotate. The drive is so arranged that it starts when the cover is pulled down over the armature and stops when it is raised. The action of bringing the cover and driving belt (Fig. 5) on to the armature operates an air switch which sets the tool slide moving along the bed of the lathe; at the end of a cut, pre-determined by an air-button, the tool returns automatically to the starting position and so remains until the cover is lifted, the armature replaced with an unfinished one, and the cover again lowered.

Fig. 4. Close-up of the tool-slide and slide driving cylinder on the Mk. II S.E.M. commutator turning lathe.

L. M. Van Moppes (Diamond Tools) Ltd, of Basingstoke, Hants, have made a study of the machine, using Diatipt tools to B.S.I. Specification B.S. 1120 : 1943, and issued an instruction sheet incorporating their findings. From these, they have deduced that the best results are obtained when a tool is cutting at a surface speed of 800 to 1,000 ft/minute (243.83 to 304.47 m/minute) and traversing at a speed of 1 in. (25 mm) per second—this is for a finishing cut from 0.001 to 0.002 in. (0.025 to 0.051 mm); the concentricity to be expected is in the order of 0.00015 in. (0.004 mm) and the finish down to 8 to 10 micro-inches.

Hoover Ltd, like other manufacturers, subject each commutator to two turning operations—a roughing and finishing run. The rough turning is done with a diamond which has previously finish-turned 25,000 commutators; it has been found that 40,000 commutators can be rough-turned before the diamond need be returned to the manufacturer for resetting and dressing.

Black & Decker Ltd have been obtaining production runs of 240 finish-turned commutators an hour while using a 3-facet diamond; they are now experimenting with a single-facet stone to obtain ever better results.

One manufacturer calculated that, by changing over from a conventional lathe to an S.E.M. commutator lathe, he reduced turning time by as much as 79%.

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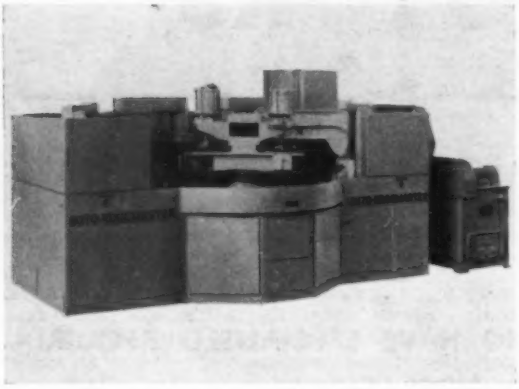
Automation Comes to the Glass Industry

Diamond and Boart Products Introduce the 'Auto-Edgemaster'



The "Auto-Edgemaster" during pencil edging operations.

As with most other industries over there, the Australian glass industry has found itself over the last decade to be in the middle of a virtual industrial revolution.

One of the biggest factors in expanding production in the industry has been the increasing widespread use of diamond tools in the working of all types of glass. One of the most common operations, relating particularly to the motor car industry, has been the pencil edging of glass sheets to give safe edges and better appearance to the finished product.

A machine has recently been manufactured and installed which semi-automatically performs the operation on car door windows. It was designed and manufactured by Diamond & Boart Products, of Sydney, following their long experience in designing and manufacturing diamond tools and special purpose machinery for the glass industry. The machine, called the "Auto-Edgemaster," uses two special pencil edging wheels to carry out the pencil edging operation on the windows. It is able to edge glasses between 14 in. and 18 in. square, on three sides; the fourth side, which is located in the rubber clamp or frame of the car mechanism, is not pencil edged but arrissed in an earlier operation.

The machine is at present producing approximately 240 glasses an hour, which represents a cutting rate of approximately 33 ft./min. The glass is conveyed from the cutting benches to the operator who loads one piece onto either of the two work stations, after which the automatic cycle takes place. The glass is removed after edging and can be placed on a conveyor belt, and another piece replaces it on the work station.

Operating the machine

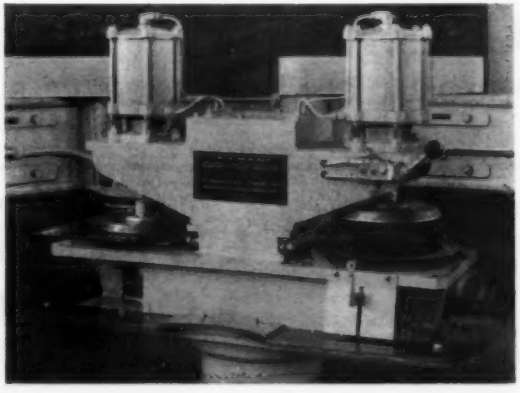
The work is loaded on to work stations of a rotary table. Each car window or light is located against two fixed stops at the back and a retractable stop on the side. The stop is retracted to allow the left hand edge of the glass to be pencil edged. Once having been located the glass is automatically clamped by a suitable clamping pad by an air cylinder.

The cam shafts which control the air clamping cylinders and retractable stops are built into the machine under the operating table. These cams operate valves which supply air through the air swivel, via the gear box, to pilot valves located between the two work stations. The pilot valves control the actual cylinders performing the work to make the whole of the cycle fully automatic. The table drive is by means of a variable speed drive unit infinitely variable between .6 and 3 rev/min with provision for elimination of all 'back-lash' on the work table.

At these speeds the machine's output is between 72 and 360 pieces an hour.

The work is located relative to two templates, the contours of these being followed by adjustable cones which, in turn, guide the two pencil edging wheels. The templates are made to suit each particular shape of glass being ground;

The machine opened up to show both work stations.



once accurately formed, they will produce virtually any number of glasses to a predetermined size and shape.

Design features ensure accurary

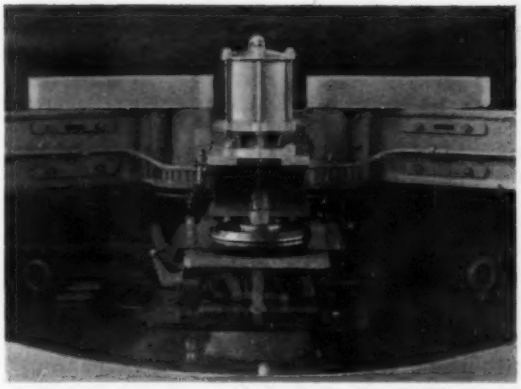
The adjustable cones enable wheel wear to be taken up so that the desired size may be accurately obtained throughout the life of the wheel.

The twin pencil edging heads mounted on the arms are driven by specially built 3 hp. electric motors. Extreme care was taken in their manufacture to eliminate vibrations in running, which if transmitted to the grinding wheels could mar the finish of the ground glass.

The pencil edging heads are of proven design, very rigidly constructed and built to very fine limits. Similar heads have been used by the glass industry over a number of years with virtually no maintenance being required and giving excellent results. All revolving parts are dynamically balanced with the object of eliminating vibration and improving both wheel performance and the finish of the glass.

Safe, simple controls

Operation of either of two stop buttons, located at the front of the machine, withdraws the whole of the wheel head assembly from the template and work pieces in an emergency. The same buttons also stop both the wheels and the work head and makes the machine virtually 'dead.'



A piece of glass clamped on one of the work tables.

Solid construction is a very important feature of the machine. The weight is approximately 6 tons complete; the water tank holds 200 gallons

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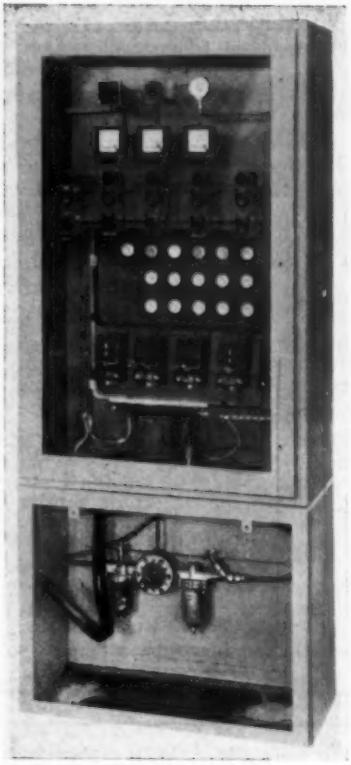

The control panel of the " Auto-Edgemaster "

News in Brief

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One of the important problems solved by the Institute while designing the well was the replacement of steel pipes by light-alloy pipes. A pipe string of special alloys is three times as light as one made of steel, apart from having great strength and being more heat resistant—qualities that become especially important at great depths. The temperature at a depth of 6 miles reached 350° C. In these conditions the customary clay muds widely used in drilling do not work.

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efforts of scientists at the drilling technique and cement industry research institutes.

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A diggers' committee will assist and advise in the administration of digging during the trial period.

Those who hold licensed claims will be entitled to sell diamonds to licensed buyers. The latter must buy at prescribed centres on fixed days, in order to enable claimholders to compare offers made by the various dealers. Licensed dealers will be required to conclude deals only in the presence of a representative of the Paramount Chief. They are also required to present the stones they have purchased to a Government diamond control office in Maseru, for registration and valuation before exporting them.

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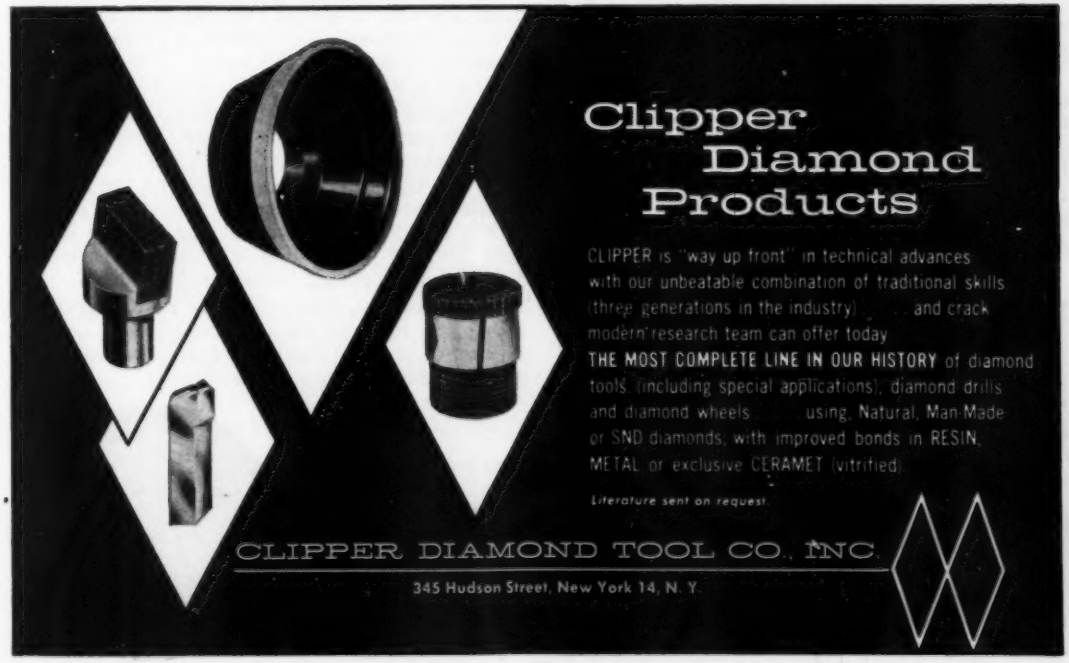
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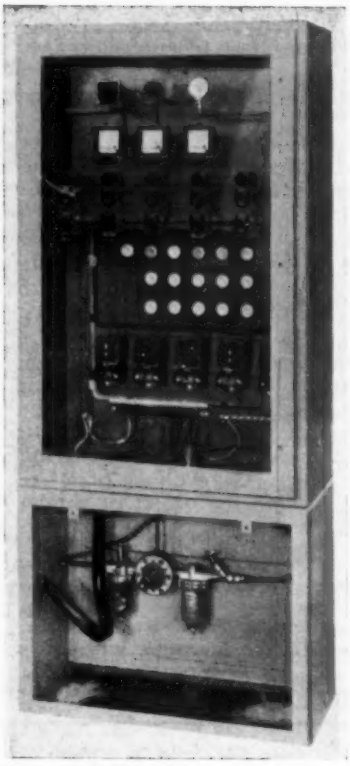

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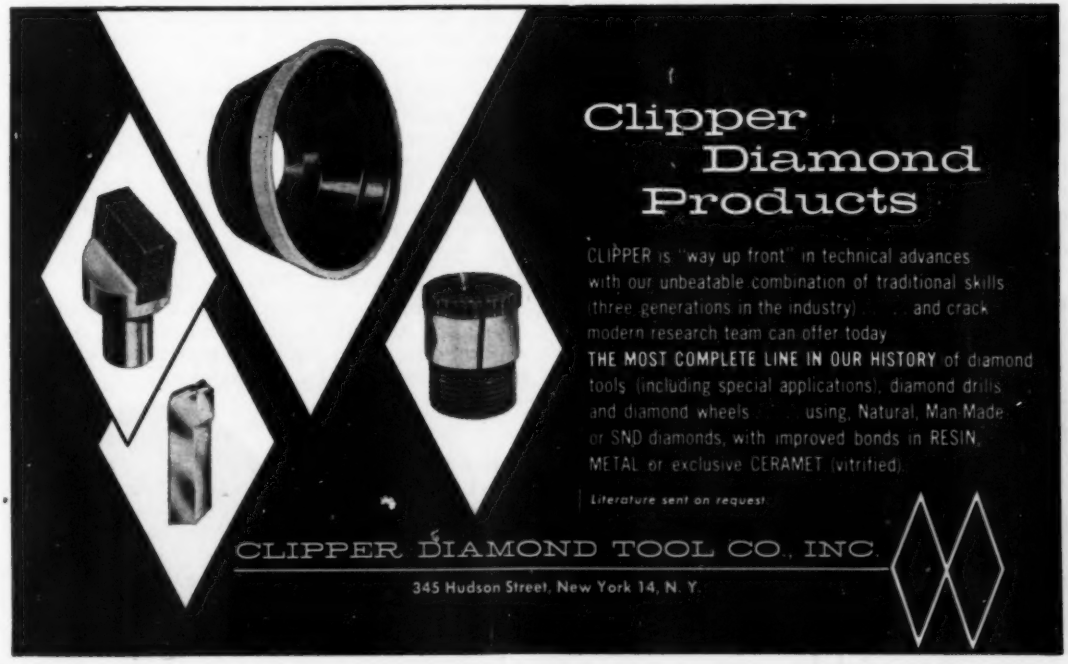
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New Materials for Machining Nimonic and other Hard Alloys

New high-grade Tungsten carbide

The heat resisting alloys and toughened steels now being used in aircraft, missiles and reactor components very quickly wear tools of high-speed steel or tungsten-carbide.

Since the introduction of these alloys, research has been continuously going on to find a material which will cut them accurately, at greater speeds, and give a better surface finish.

This problem has been engaging the attention of metallurgists in Britain and the United States of America and, recently, both countries have announced the development of new cutting materials.

A fine grain carbide, said to be the finest yet marketed, has been developed after years of intensive research by the staff of Hoy Carbides Limited, of High Wycombe, Bucks., England, under the direction of the Chief Metallurgist and Technical Director, Mr. E. M. Holt, B.Sc., A.Met., A.I.M. Correct proportioning of alloys with the carbide coupled with precise sintering has produced a tungsten carbide which, when used as a tip for various machining tools, has given impressive performance figures over several months with leading British aircraft and missile manufacturers.

Hoy Carbides Limited say that experience has shown the new grade of tungsten-carbide, known to them as CW grade, will machine the more difficult alloys at greater speed and will give a better finish and longer runs between regrinds than any of the grades of carbide available previously.

Fig. 1. Inspecting carbide samples with the surface microscope.

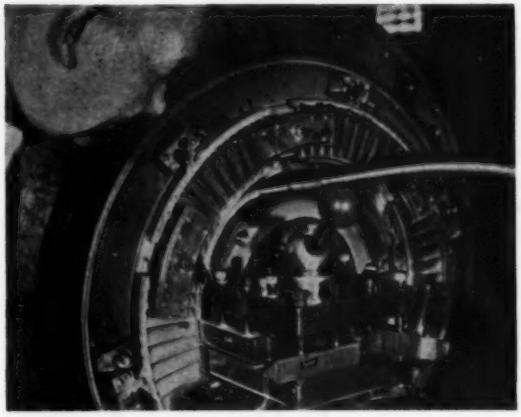

Fig. 2. A typical job on which CW grade carbide is employed. (Photograph by courtesy of Bristol Siddeley Engines Ltd).

Owing to the difficulty of obtaining a consistent quality of tungsten powder of extreme fineness of grain (super sub μ) at an economical price, it was decided to use raw materials and to process these; for this, a specially designed plant, which included high-vacuum precision temperature-controlled furnaces, was used.

To finish a tip to the correct size considerable use is made of industrial diamond. When the tungsten-carbide is in the 'green' state it is cut by electro-plated diamond disks 0.015 in. wide; after the tips have been brazed to the shank, surplus brazing materials and steel are removed with a silicon-carbide wheel; the carbide tip is then finished on a 100-150 grit, high-content diamond-impregnated metal-bonded wheel.

Special or non-standard tools are finished on 100 grit, resinoid-bonded cups; for certain applications—form tools in particular—electro-plated diamond disks are preferred.

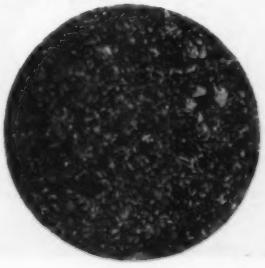

Fig. 3. Hoybide CW seen at 1,500 magnifications, the majority of grains are super sub micron.

Test samples used for microscopic examination are polished with diamond paste impregnated with 1 micron grains.

Improved H.S. steel

The material developed in the United States, by Braeburn Alloy Steel Division of Continental Copper & Steel Industries Inc., of Braeburn, Pennsylvania, is a high-speed steel. Included in its composition are carbon 1.15%, chromium 4.25%, vanadium 2.25%, tungsten 5.25%, molybdenum 6.25%, cobalt 12%; it is being used for broaches, form-cutters, hobs, end mills and milling cutters, counterbores, cold-extrusion punches, reamers, rolls and blanking dies.

Braeburn claim that Braecut, the name this new material is known under, approaches the hardness of diamond, will cut virtually all other known metals and alloys and, in extensive tests, kept its cutting edge up to 10 times longer than standard tool steels. It is also said to have been used to cut alloy steels that high-powered rifle bullets could not pierce.

It has a Rockwell hardness of up to 70 C and retains its cutting edges, it is claimed, even when red hot. It can be readily ground with conventional vitrified aluminium oxide wheels.

Diamond News

The Technical programme for the year 1961-1962, of the Sierra Leone Selection Trust, is reported to allow for another year of heavy capital investment in operations both in the Tongo and Yengema diamond fields. The cost of this capital development is an estimated £500,000. Of this amount, £170,000 will be spent on milling and mining equipment to keep the operation running at the same rate and to allow for improved efficiency. The purchase of two large D8 caterpillar bulldozers is a most important item in the programme. Each will cost £17,000 and enable large-scale rehabilitation of mined-out areas to take place. It is expected that this will be of great benefit to farmers in the regions that have been subject to intensive mining.

It has been reported from South Africa that thirty-three of the Republic's 380 licensed diamond diggers are getting rich fast at the Windsorton breakwater, near Kimberley.

The six acres, from which they have partially diverted the Vaal River by building the breakwater, are yielding diamonds at an average rate of R.2,000 (£1,000) a week a head.

One stone so far found has been sold for R 4,400 (£2,200), and another for R 2,600 (£1,300). Of the thirty-three diggers, only eight made less then R 4,000 (£2,000) last week. Evidently fired by these reports, others are rushing to the area to stake their claims.

"Wheel Trueing" Acquires Texas Firm

It has been announced that Drilling and Service Inc. of Dallas, Texas, has been acquired by Wheel Trueing Company. Wheel Trueing has been a leading manufacturer of industrial diamond tools for 50 years and since 1946 the Texas firm has been their sales and service outlet in the oil field drilling industry. The change, it is said by H. E. Robinson, President of Wheel Trueing, will better co-ordinate manufacture and research with sales and service.

"Diamond coring and drilling has developed into a recognised oil field procedure in the last 10 years," he said, "and is continuing to grow. Engineering developments are presently aimed at the extended use of diamond drilling in this field."

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NPL Produces Synthetic Diamonds

The National Physical Laboratory report for 1960* shows a new emphasis on high pressure standards work and ultra-high pressure research at 10,000 atmospheres upwards. It is in this latter range of pressures that the production of synthetic diamonds becomes feasible, and, although the Report makes no mention of the fact, it is understood that very small synthetic diamonds have already been produced during studies of the effect of pressure on the restivity of semiconductors.

The apparatus used in these studies is a tetrahedral high pressure device capable of reaching 100,000 atmospheres. Investigations into the production of pressures of the order of 1,000,000 atmospheres by means of explosive shock waves, are being carried out.

Optics and gratings

The Light Division, in conjunction with the Services Electronics Research Laboratory, has made a study of the surfaces of spheres of ferrite and sapphire, using the Twyman interferometer. Another group has been formed to study, initially, the factors controlling the spatial and spectral coherence of the bursts of nearly monochromatic light which can be produced by ruby and other fluorescent crystal masers under intense flash excitation.

A complete new series of diamond-ruled metrological grating helices has been produced on the servo-controlled lathe. This series provides 2,500 and 500 lines/in., and 100, 125 and 250 lines/mm. The progressive error lies between ± 20 and ± 50 micro-in. on a 10 in. length. This inconsistency is believed to be due to small temperature fluctuations in the work and the control grating during ruling, and a system is being considered to overcome this.

Hardness testing

The new deadweight standard machine for hardness measurement in the Vickers diamond pyramid scale has been used to provide valuable information for the British Standards Institution's committee which is considering the revision of hardness testing specifications. The construction of the new deadweight standard machine for hardness measurements in the Rockwell B and C scales has been completed and, after minor modifications, should soon be in use.

Work has progressed on the standard microscope for measuring the size of Vickers diamond pyramid indentations, and a technique has been developed to meet the very exacting alignment requirements of the optical components. Routine measurements on hardness test blocks have established that the N.P.L. is maintaining a standard of hardness in the Vickers scale which is constant to within ± 0.5 per cent of the hardness value in the range 950 to 200 HV.

Other studies

The Director of the National Physical Laboratory, Sir Gordon Sutherland, has started to re-investigate the interpretation of the infra-red spectra of diamond, silicon and germanium. During 1960, Sir Gordon attended symposia on diamonds at Oxford and Reading. Among the Director's publications in 1960 was 'Some comments on the infra-red spectra of diamonds, silicon and germanium,' *J Opt Soc Amer* 1960 (Dec).

*Report of the NPL for 1960, published by H.M.S.O., price 9s 6d.

Award of the Royal Society of Arts

A Silver Medal of the Royal Society of Arts will be presented to Professor S. Tolansky, F.R.S., on 1st November in London. This Award was given for a paper, entitled "Some Folklore and History of Diamond," delivered by Professor Tolansky before the Royal Society of Arts on Wednesday, 15th March, 1961.

Symposium on Drilling in India

The council of Mining, Geological, and Metallurgical Institute of India has decided to hold a symposium on 'Drilling in India' in Calcutta sometime during November-December 1961. During the third Five Year Plan a considerable amount of drilling is envisaged on which a considerable amount of money will be spent. The object of the symposium is to assemble all those connected with the subject to discuss ways and means of achieving the maximum benefit at minimum cost. Subjects to deal with are as follows :—

1. Exploration Drilling for Minerals.
2. Drilling in Hydel and Irrigation Projects.
3. Oil Drilling in India.
4. Standardisation of Methods and Equipment.
5. Training for Drilling Personnel.
6. Establishment of National Core Library for facilitating Co-ordination of all Drilling Records.

The Dallow Lambert 'Dalmatic' Automatic Fabric Dust Collector

The ' Dalamatic ' has been designed to provide a universal, continuously-rated filter, capable of giving trouble free service over an extended period of time.

Although the ' Dalamatic ' uses limited quantities of compressed air as a cleaning medium, it embodies the fundamental dynamic air flow characteristics generally associated with some blow ring types filter, but has the desirable virtue of having no mechanical moving parts. The basic design incorporates an integrated system of standard filters in such a manner as to enable installations to be assembled capable of handling air volumes in the order of 100,000 cu.ft./min or more if required.

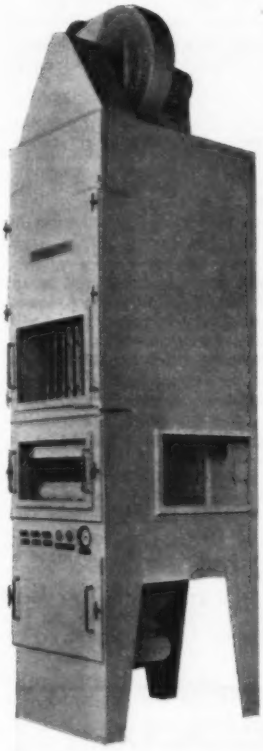

Fig. 1 (left). Shows a two tier integral with fan, hopper, rotary valve, and supports.

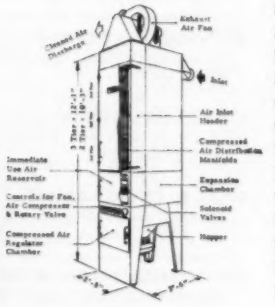

Fig. 2 (above). Multi assemblies of the unit.

The ' Dalamatic ', in simple form, may consist of one, two, or three tier assemblies, mounted on a hopper, silo pressure vessel, or conveyor to suit the individual application. Fig 1 shows a two tier integral with fan, hopper, rotary valve and supports. Each tier contains nine pad filter elements with a fabric area of 60 sq feet. In operation, contaminated air is entrained into the filter above the level of the filter elements, and is filtered into a common outlet header running the height of the filter. Dust initially retained on the filtering medium is removed in an orderly and controlled manner to the hopper below the filter, and is eventually discharged by means of a rotary seal or other conventional methods.

Multi assemblies of the unit shown in Fig 2 can be achieved in a side by side arrangement, back to back, or a combination of both. The maximum fabric area of single unit is obtained by three tiers, giving, at present, 180 sq ft of fabric. Multi assemblies increase filtration accordingly.

It was recently reported from Sierra Leone that many feet of river bed will be exposed for diamond mining when the Bafi River Project, in the Kono district, is implemented. The work, supervised by the Mines Department, serves to divert the course of the river near Dandaiadu. The scheme entails the digging and removal of more than 6,000 cubic yards of soil and is thought to be bigger than the Moinde Diversion Scheme, carried out some time ago.

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HABIT offer co-operation to present members of the European Common Market with a view to trade-link being established when Great Britain becomes a member.

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HABIT extend a cordial welcome to overseas visitors at their Offices and works in London.

INDUSTRIAL DIAMOND EXPERT REQUIRED EXCELLENT SALARY AND FUTURE PROSPECTS ARE ASSURED : APPLICANT MUST BE CONVERSANT WITH CLASSIFICATION OF ALL TYPES OF INDUSTRIAL DIAMONDS. PLEASE WRITE BY HAND IN THE FULLEST CONFIDENCE TO BOX No. 2122.

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HABIT have a vacancy on their staff for an old boy to hold a unique position. Preference given to diamond man between 70 and 90 who is not so infirm that he cannot shuffle around and who can reminisce about the days when he was panning diamonds with the Boers and relate other boring stories.

Special consideration will be given to applicants from families 'soaked' in diamond tradition and who made a fortune out of their allocation losses.

Apply in own handwriting, no matter how spidery, with copies of references from past employers for the last 50 years : Secretary, Habit Diamond Tooling, Ltd., Lurgan Avenue, W.6.

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INDUSTRIAL DIAMOND ABSTRACTS

Industrial Diamond Information Bureau,
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1961 Volume 19
OCTOBER

DIAMOND MINING AND INDUSTRY

The congress in Africa : The diamond industry

Anon. *Min Mag, Lond* 1961 Vol 104 (6) pp 337-339 (June)

The subject discussed was the marketing of diamonds and the system developed over the years to secure a high degree of stability in what could be a very chancy business. The Central Selling Organisation handles about 80% to 85% of the total world output. Marketing, respectively of gem and industrial diamonds is undertaken by the Diamond Trading Co and by Industrial Distributors acting in conjunction with the Diamond Producers Association. To maintain stability, large cash reserves are sustained but it is complementary and essential that the Central Selling Organisation handles a large proportion of world production. Handling the problems of recalcitrants, who seek the advantages of the system without paying the price, is a main pre-occupation of the organisation, in which it has been reasonably successful, obtaining the goodwill and co-operation of the major producers and governments concerned. Policy aims at stability rather than maximum prices. The reasons for close control are that diamonds are expensive and are wanted both for their beauty and as an investment in a permanent asset, that annual production is a small proportion of the total diamonds held, therefore values must and should be protected. Also, De Beers has decided to initiate the commercial production of synthetic grit against the possibility of interference with the regular production of Congo industrial diamonds. 1 illustr.

E *F.251/Fh.251/F.231.361*

Copper for diamonds

Anon. *Mindrill Bits & Pieces* 1961 Vol 14 (6) p 4 (June)

A " copper for diamonds " agreement has it is stated, been reached between the copper-rich State of Katanga and the diamond mining State of South Kasai.

D *Bfh F.251.365*

Diamond in Basutoland

Anon. *Min J* 1961 Vol 257 (6574) p 175 (Aug)

It is stated that speculators have been flooding into Basutoland in anticipation of diamond rush in the Letsa-La Drai area. The licences are to be restricted to Basuto residents but Europeans are said to be flying into the area to finance the Africans and thus gain a share in the workings. *D* *F Hd.361*

Diamond in Sierra Leone

Anon. *Diamond News* 1961 Vol 24 (10) pp 8-9 (July)

In this report on the Sierra Leone diamond industry it is stated that illicit diamond dealing remains the biggest problem, and that it has been evident that new laws are needed to deal with it.

D *F.25.3672*

Diamond lecture

Anon. *Watchmaker* 1961 pp 87-88 (May) ; *Gemmologist* 1961 Vol 30 (361) pp 155-158 (Aug)

Pof S. Tolansky's recent lecture to the Royal Society of Arts, ' Some Folklore and History of the Diamond ', is reviewed. *E* *F.28*

Gemstones of India

C. K. Zaveri. *Gemmologist* 1961 Vol 30 (361) pp 143-146 (Aug)

In conclusion the author states that in his opinion, if proper geological surveys were made by competent engineers to locate the extent of deposits as yet untouched, the future of gem mining in India would be assured, and that it might be possible to find considerable quantities of diamonds from the inner beds of Kistma, the vicinity of the old mines of Golconda and from the mines of Panna.

D *Bb.12.371/Eb.12.371*

Exploitation of new Soviet field expensive

Anon. *Mindrill Bits & Pieces* 1961 Vol 14 (6) p 4 (June)

The New York, *NY Times* reports that the new diamond area discovered in the valley of the Sokhsolookh River is regarded as being so important by the Soviet authorities that they are apparently diverting very scarce resources from the diamond area about Mirny to begin development of the new field. By the summer it is expected to have the first mechanical equipment operating so as to separate diamonds from the earth and gravel in which they are found in this region. *D* *Ebc.13.332*

Meteorite analysis : The search for diamond

D. V. N. Sarma, T. Mayeda. *Geochimica et Cosmochimica Acta* 1961 Vol 22 (2/4) pp 169-175 (Mar) ; *Battelle tech rev abstr* 1961 Vol 10 (7) col 691 (July)

No diamonds were found in seventeen meteorites using the methods described.

D *Bnz F.12*

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South Africa : diamond mining on the sea bed

Anon *New sci* 1961 Vol 11 (249) p 467 (Aug 24)

Marine Diamond Corp will use an air siphon and jet arrangement, which has already been tested by removing shell, sand, and gravel from pipeline trenches under water. Materials from the sea bed will be forced up and transferred to diamond pans which together can cope with more than 100 tons/hour.

D *Bnt F Hd.361*

Mining miscellany

Anon. *Min J* 1961 Vol 257 (6574) p 167 (Aug)

An area of six acres near Kimberly, from which the Vaal River has been partially diverted for the building of a breakwater, is reported to be yielding a considerable number of diamonds. *D* *Hd.3612*

Mining technology in 1960

Anon. *Min J* 1961 Vol 257 (6574) pp 160-161 (Aug)

Describes general developments in mining technology in 1960. *D* *Cb.132*

Terminology of Yakut diamond bearing rocks

B. M. Vladimirov. *Geol i geofiz* 1960 (11) pp 115-116 ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (2) p 525 (May) (Original in Russian)

D *Ebb.332:.291*

Transactions of the Seventh Commonwealth Mining and Metallurgical Congress

South African Institute of Mining and Metallurgy, PO Box 1183, Johannesburg. 4 pp, illustr

Papers presented at the South African section of the Congress which was held from 10th April to 6th May, 1961 included : "The diamond industry" by H. F. Oppenheimer ; "Diamond mining in Southern Africa", by G. S. Giles ; "Diamond recovery in Southern Africa", by R. J. Adamson and "Industrial diamond research", by R. G. Weavind and J. F. H. Custers.

D *F Hd.25:.231.361*

Vegetation cover as an indicator of kimberlite pipes

A. N. Lukicheva. *Geol i geofiz* 1960 (11) pp 35-48 ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (2) p 525 (May) (Original in Russian, summary in English)

D *Ebb.33*

PHYSICAL, CHEMICAL, & MECHANICAL PROPERTIES OF DIAMOND

Proceedings of the fourth conference on carbon

Anon. *Battelle tech rev abstr* 1961 Vol 10 (7) col 658-659 (July)

Book, Pergamon Press, New York, 778 pp.

Delegates represented university, government, and industrial laboratories which study carbon in all its forms, including diamond, by physical or chemical methods and whose interests encompass manufacture, properties, and use of carbonaceous materials.

[Not in library of Industrial Diamond Information Bureau]. *D* *Bhb U.231/F U.231*

Detecting diamond simulants

R. Webster. *Watchmaker* 1961 pp 74-77, 102 (May)

5 illustr. *E* *F Hkb*

Explosion creates artificial diamonds

W. B. Wallace. *Prod Engng* 1961 Vol 32 (35) p 5 (Aug)

Diamond particles, the largest of which was 40 μ in diameter, have been produced at the Poulter Laboratories of the Stanford Research Institute. The experiments by P. S. De Carli of SRI and J. C. Jamieson of the University of Chicago produced diamond from fragments of pure rhombohedral graphite when subjected to a shock of 30,000 atm for one microsecond, it is stated.

See also : *Industr Diam Abstr* 1961 Vol 18 p A199 (Aug). *D* *Fh Ha Vcb*

Synthesis and X-ray analysis of diamond

H. Li. D. Pugh, J. Lees and J. A. Bland. *Nature, Lond* 1961 Vol 191 (4791) pp 865-867 (Aug)

The apparatus and methods used by the National Engineering Lab team to produce synthetic diamond crystals are described, also the subsequent detailed X-ray analysis of Plastics Division, Imperial Chemical Industries Ltd, of one of these crystals. 4 illustr, 1 table. *D* *Fh Ha/Fh Vub*

Luminescence spectra of diamonds from the tube 'Mir'

G. O. Gomon. *Dokl AN SSSR* 1961 Vol 137 (4) pp 852-854 (Apr) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 639 (June) (Original in Russian)

D *F Ukn*

Temperature dependence of the X-ray luminescence and dark conductivity of diamonds of the Yakutsk deposit

K. N. Pogodaev, E. S. Vilutis. *Izv An SSSR Ser Fiz* 1961 Vol 25 (3) pp 373-375 (Mar) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (2) p 372 (May) (Original in Russian)

D *F.332:Ue/F.332:Ukn*

GJ's quick course in gemmology, part 5 : understanding double refractions

Anon. *Goldsm J* 1961 Vol 67 (511) pp 396-399 (Sep)

8 illustr. *D* *Bb Uk*

Neutrons to find diamond impurities

Anon. *New sci* 1961 Vol 11 (248) p 416 (Aug 17)

E. C. Lightowlers of King's College, London, is applying the method of slow neutron activation analysis to diamond for the first time. It can detect quantities of impurities of the order of a few parts per million without destroying the diamond. It is of great interest to know what the impurities in diamond are, it is stated, because their electrical and optical properties are greatly influenced by them. Mr Lightowlers hopes to be able to corelate the impurities with the physical properties of the diamonds particularly their luminescence, about which very little is known. A brief description of the method employed is included.

D *F Gk Qvc*

The hardest tool

K. Evseev. *Prof tekh obr* 1961 Vol 18 (1) pp 14-16 (Jan) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (2) p 372 (May) (Original in Russian)

D *Pd Unh*

Etching of diamond surfaces with gases

T. Evans, D. H. Sauter. *Phil Mag* 1961 Vol 6 (63) pp 429-440 (Mar)

Etching experiments are described in which diamonds showing octahedral, cubic, and dodecahedral faces are heated in air within the temperature range of 800° C to 1400° Centigrade. 11 illustr, 14 ref.

E *F Htz Vbb*

Man-made gemstones : synthesis of diamond

C. F. Chatham. *Gemmologist* 1961 Vol 30 (361) pp 147-150 (Aug)

Although the present methods for producing industrial diamond grit are costly, radical improvements now under consideration may, in the author's opinion, reduce the price to a few pence per carat in the near future. The article gives a short general history of the synthesis of various gemstones. 2 illustr.

D *Fh Ha*

The formation and conditions for formation of natural synthetic diamonds and other natural and synthetic high-pressure/high temperature phases

A. Neuhaus. *Chemie-Ingenieur-Technik* 1961 Vol 33 pp 220-224 (Mar); *Battelle tech rev abstr* 1961 Vol 10 (7) col 657-658 (July) (Original in German)

Fields of application for the new high-pressure/high temperature technology in science, industry, and nature are outlined—new synthesis, high-pressure transformations, pressure synthesis, spread of fields of state, high-pressure sintering.

D *Cql Vcb.21/Fh Ha Vcb.21/F Hb Vcb.21*

The relative hardness of the hard direction in diamond

E. M. Wilks. *Phil Mag* 1961 Vol 6 (65) pp 701-705 (May)

A method is described of determining the relative hardness of the hard direction in diamond, using a micro-abrasion tester and diamond impregnated cutting wheels. Cube, dodecahedron, and octohedron planes have been studied and an error of hardness established between the various directions on these planes. This order of hardness should also apply for ordinary diamond polishing when loose diamond powder is used on a flat scaife, although in this case the differences in hardness are very much greater. 7 ref.

E *F Unh.21*

FP 1,243,279 (Dec 29, 1958—USA) **H. P. Bovenkerk, General Electric Co**

Method and device for manufacturing crystals of diamond. Procédé et dispositifs pour fabriquer des cristaux de diamant

Synthetic diamond is obtained from another form of carbon by the application of high pressure (50,000 to 90,000 atm) at elevated temperatures (1300 to 1800° C) maintained for period ranging from a few seconds to 90 minutes. Carbon and a metal catalyst are placed in layers in the reaction chamber, the catalyst being an alloy of a metal of Group VIII of the Periodic Table or of chromium, manganese, tantalum with another metal not specified above. This alloy should contain an element for forming a carbide. 6 claims, 3 illustr.

J *Fh Ha.545*

PHYSICAL, CHEMICAL, & MECHANICAL PROPERTIES OF HARD MATERIALS

Braeburn tool steel hardens to Rh 70 C, stays tougher, grinds easier than T-15

Braeburn Alloy Steel Corp, Braeburn, Pa. *Amer Mach* 1961 Vol 105 (15) p 117 (July)

The physical properties of Braecut are detailed. This is a new tool steel claimed to have exceptional qualities.

D *Pd Rw Um*

Process increases tool strength and resistance

Temp-Lok Corp, Box 683, Huntington, Ind. *Mod Mach Shop* 1961 Vol 34 (1) p 207 (June)

The Temp-Lok process, said to increase the strength and wear resistance of high speed steel cutting tools and die steels, is accomplished by reorientation of the atoms in the crystal.

D *Pdb Uqe.21*

New high strength alloy

Haynes Stellite Co. *Amer mach* 1961 Vol 105 (16) p 61 (Aug)

Containing tungsten and zirconium, Haynes Alloy CB-752, a new high strength columbian-base alloy, which has an ultimate strength of over 25,000 lb/sq in. at over 2400° F, can, it is stated, be fabricated by conventional methods including welding. Its fabricability is said to overcome a major stumbling block.

E *Bfxk U*

Band saw blades

Dia Chrome Inc. *Ceram Age* 1961 Vol 77 (5) p 21 (May)

A new type of band saw blade, Dialloy, is claimed to be superior to steel because of its resistance to work hardening. Dialloy is used only for diamond coated band saw blades, available in standard widths from ¼ to 1½ inches.

E *Bfx Pcz*

Notes on tungsten today

L. Sanderson. *Tooling* 1961 Vol 15 (8) pp 46-48 (Aug)

B *Sbz.21*

Physical and mechanical properties of tungsten and tungsten-base alloys

V. D. Barth. Battelle Memorial Institute, *Defense Metals Information Center, DMIC Report No 127* 1960 60 pp (Mar); *Battelle tech rev* 1961 Vol 10 (8) p 17 (Aug)

D *Bfxk Um/Bfxk Un*

Review of recent developments in the technology of tungsten

V. D. Barth. Battelle Memorial Institute, *Defense Metals Information Center, DMIC Memorandum 108* 1961 6 pp (May); *Battelle tech rev abstr* 1961 Vol 10 (8) col 792 (Aug)

Surveys fabrication, properties, structures, and applications.

D *Bfp Vwl.132*

How to choose the right carbide

G. C. Nalon & R. G. Brierley. *Metalworking Prod* 1961 Vol 105 (33) pp 64-68 (Aug)

Basically there are two types of sintered carbide, the straight tungtsen carbide grades and the steel cutting grades. The effect of the various additional elements on the basic sintered carbide are described, indicating the correct composition for a given application. 14 illustr.

D *Pdc Qz*

Electron structure of carbide in steel which accounts for its wear resistance

V. M. Karashchuk. *Trudy MITT* 1960 (123) pp 147-153; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 614 (June) (Original in Russian)

D *Bfcb U.21*

Boron silicide- a new high-temperature material

Anon. *Nucleonics* 1961 Vol 19 (8) p 89 (Aug); *Engrs Dig* 1961 Vol 22 (8) pp 85-86 (Aug)

Allis Chalmer's microhardness measurements on tetraboron silicide show an average Knoop (100 gm load) hardness of 2,400. For hexaboron silicide they have obtained hardness values of 1,900 to 2,400.

D *Bhcz Cvdb*

A new technique for the production of synthetic corundum

E. A. D. White. *Nature, Lond* 1961 Vol 191 (4791) pp 901-902 (Aug)

D *Bbcb Qc*

Synthetic and other man-made gems

R. J. Homes. *Foote Prints* 1960 Vol 32 (1) p 3; *Brit ceram abstr* 1961 (5) p 214A (May)

22 pp paper on: the nature of gems, their identification, imitataions; assembled stones and reconstructed stones; the Verneuil flame-fusion process; production of synthetic corundum and its identification; synthetic spinel and its identification. *B* *Bbb Ct*

BP 860,499 (Jan 27, 1958) **R. H. Wentorff jun, General Electric Co**

Methods of making cubic boron nitride

All presently available abrasive materials deteriorate at elevated temperatures. This is true even of diamond. The temperature may reach 1500-2000° C. when grinding *eg* sintered silicon carbide in which case the diamond as the abrasive medium may burn away and be converted to its soft graphitic form. Cubic boron nitride is substantially equal as regards hardness to diamond but has a superior thermal stability. Cubic boron can be prepared by subjecting a source of nitrogen and a source of boron such as hexagonal boron nitride to a pressure from 65,000 to 110,000 atm at temperatures between 1200 and 2000° C in the presence of a catalyst selected from the class consisting of alkali metals, alkaline earth metals, tin, lead, antimony and nitrides of these metals. Magnesium and calcium are mentioned in particular. It was found that cubic boron nitride lapping compound was as efficient as commercial compound (diamond powder in olive oil) in grinding down the surface of a diamond. 12 claims, 6 illustr. *J* *Re.545*

DIAMOND, ETC, IN INSTRUMENTS

Man-made stones for hi-fi

Anon. *Diamond News* 1961 Vol 24 (10) p 15 (July)

Synthetic diamonds possessing more suitable qualities than the currently used natural gems may, if tests are successful, be used in high-fidelity gramophone stylii. *D* *Fh Nfs*

Pneumatic attachment for diamond drag marking machine

H. P. Preis Engraving Machine Co. *Mach Tool Blue Bk* 1961 Vol 56 (8) pp 207-208 (Aug)

A pneumatic attachment for a panta-engraver, designed for marking hardened steel, tungsten carbide, and all nonferrous metals, is briefly described. 1 illustr. *D* *Bf Cp Nc*

Metallurgical microscope

William J. Hacker & Co Inc, PO Box 646, West Caldwell, New Jersey. *Rev sci Instrum* 1961 Vol 32 (5) p 616 (May)

This microscope, it is said, can be converted into a microhardness tester or interferometer for measurement of surface finish. It can also be used for high temperature microscopy for temperatures up to 1800° C and components for grain size measurements and photomicrography can be adapted. Microhardness tests are carried out with diamond of Vickers or Knoop shape and a load range of 5-100 g. 1 illustr. *E* *Bf Cvdb Nd Wghd*

Surface microtopography

S. Tolansky. *J Franklin Inst* 1961 Vol 271 (2) p 150 (Feb)

Book: 296 pp New York Interscience Publishers Inc, Price $9.

Includes microphotographical studies on both natural and cleavage faces of a variety of crystals, the finish of machined and polished surfaces, and the study of hardness test indentations. It should be of special interest to the diamond, machine tool, and watch industries.

[Not in library of Industrial Diamond Information Bureau]. *E* *Bf Cvdb Nd Wghd*

BP 856,997 (Oct 9, 1958) **A. C. Haddy, Decca Record Co Ltd**

Gramophone pickups

For reproducing sound signals recorded in two transverse directions the stylus tip must be capable of movement in the direction of the stylus axis as well as laterally. Possible movement in the direction of the groove has to be minimised and this has been hitherto effected by a thin steel wire under tension. There is however the danger that accidental damage occurs by a force of such magnitude that the wire becomes slack and obtains a permanent bend. This cannot occur if the wire is replaced by a non-metallic restraining member under tension such as a polyester or polyamide

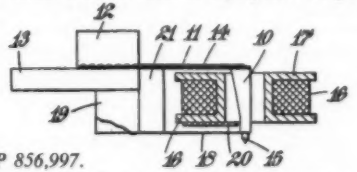


Fig 1. BP 856,997.

fibre (nylon or " Terylene "). In Fig 1, 10, 15 is the diamond tipped stylus and the mild steel armature on spring strip 11. 18 is a multi-strang " Terylene " thread. 6 claims, 2 illustr. *J* *Tdc.21.545*

DAS 1,090,439 (Feb 22, 1956) **F. Werner, Continental Electroindustrie AG Askania-Werke**

Method of making precision graduations, in particular circular divisions for optical angle measuring instruments or the like. Verfahren zur Herstellung von Präzisionsteilungen, insbesondere von Kreisteilungen für optische Winkelmessinstrumente od dgl

The usual mechanical devices for making graduations suffer from vibrations *eg* when moving or stopping, further from thermal variations during the process of producing the graduation which can only be counteracted by expensive means. The new method overcomes all difficulties by dispensing with all movements of mechanical parts. The division marks are produced by means of corpuscular rays, in particular by cathode rays characterised by the use of electrical and/or electromagnetic means by which the rays are directed onto the fixed circular division. The focus of a beam of corpuscular rays may *eg* move along a circular path with alternating light and dark portions. 11 claims, 1 illustr. Ref cited: 2 GP; 1 DBP.

J *Qc Wbh.545*

DIAMOND TECHNOLOGY

First published 1942 as " Production Methods for Diamond and Gemstone." The second edition of this book by P. Grodzinski has been revised throughout and considerably enlarged. 840 pages, 486 illustrations, 94 tables, and indexes. From NAG Press Ltd., 226 Latymer Court, London W 6. 55s 0d, post free.

DAS 1,094,624 (Apr 17, 1957) **K. H. Schultze, O. Jaeckel, Herbert Lindner**

Device for the automatic compensation of grinding wheel wear caused by a predetermined truing feed. Einrichtung zum selbsttätigen Kompensieren des durch einen voreinstellbaren Abrichtbetrag bedingten Schleifscheibenschwundes

Known devices obtain compensation through equivalent pawl and ratchet devices for feeding the truing tool and adjusting the grinding wheel. As however other factors, such as wheel hardness, diamond shape, roughness of the trued wheel faces, *etc*, have to be taken into account, further adjustment by hand wheel is often necessary. In order to enable the adjustment on graduated scales according to certain values the driving spindle is provided with a stop, connected through a worm gear with an adjustable stop, which is set by a hand wheel in a circular path according to a stationary graduation. The worm gear permits very accurate setting in positive or negative sense as determined by measuring the workpiece. This is especially advantageous for thread grinding machines. 4 claims, 2 illustr. Ref cited : 1 USP.

J *Ab Cg Psf.545/Nv Unc.545*

DAS 1,097,159 (Dec 27, 1957—USA) **R. J. Bondley, General Electric Co**

Sound Pick-up needle with jewel point and method of manufacturing same. Tonabnehmernadel mit Edelsteinspitze und Verfahren zur Herstellung derselben

The needle is made of titanium or zirconium with a recess in its end into which the jewel point is brazed

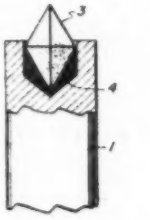


Fig 2. DAS 1,097,159.

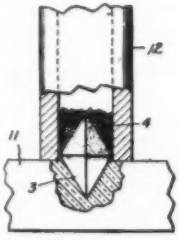


Fig 3. DAS 1,097,159.

as shown in Fig 2. A number of needles may be arranged in a row inisde a heated vacuum vessel. A molten mass 4 may be formed around the jewel held in a plate 11 as in Fig 3. In this method, suitable for larger needles, the needle 12 is preferably tubular and the solder filled in from above. The following dimensions may be used : Initial needle diameter 1 mm, the recess for the diamond 0.625 mm. The finished needle has a diameter of 0.625 mm, the total length then 1.75 mm. A suitable solder is a silver-lead alloy (30% and 70%) melting at 500 to 600° C. The free end of the diamond will be ground to a conical point with a rounded end of a radius of 0.025 mm. 5 claims, 5 illustr. Ref cited : 2 GP ; 1 DBP.

J *Qc Tde.545*

HARDNESS, WEAR TESTING, AND PRECISION GAUGING

New hardness number

B. I. Pilipchuk, S. S. Stepanov. *Zav lab* 1961 Vol 27 (2) pp 237-238 ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 678 (June) (Original in Russian)

D *Unh.21*

Device for determining the hardness of metals

V. F. Klenov. *Shkola i proizv* 1961 Vol 5 (2) pp 76-77 (Feb) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 720 (June) (Original in Russian)

D *Bf Cv Wgh*

Checks accuracy to within 2 millionths

Federal Products Corp, Providence 1, Rhode Island. *Grinding & Finishing* 1961 Vol 7 (6) p 64 (June)

The electronic comparator, Model 136B-2, checks master rings and disks to an accuracy within 2 millionths. It can measure inside diameters from 0.040 in. to 4.760 in., and outside diameters from 0 to 3.5 inches. Two scales are immediately available by switching : 11,200X magnification and 2,200X magnification.

D *We*

Electronic fingers measure to millionths

Sheffield Corp, Dayton, Ohio. *Machinery, NY* 1961 Vol 67 (12) pp 130-131 (Aug)

This universal, five-axis tape controlled measuring machine is the first of a series of automatic measurement and print-out systems designed for the simultaneous dimensional verification of internal and external contour and wall thickness to millionths of an inch tolerance. 3 illustr.

D *Wpb*

Electronic gaging + polar tracing control bearing race production

C. Hoyt. *Mach Tool Blue Bk* 1961 Vol 56 (8) pp 125-126 (Aug)

The Indi-Ron, manufactured by Cleveland Instrument Co, is used at the New Hampshire Ball Bearings Inc for gauging the roundness of ball bearings to within 0.000005 in. deviation from a true circle, it is stated. 2 illustr.

D *Qc Tcp Wbb*

Retracting contacts for dial gages

Standard Gage Co Inc, Poughkeepsie, NY. *Machinery, NY* 1961 Vol 67 (12) p 194 (Aug)

This dial gauge with retractor is designed to gauge virtually inaccessible dimensions. It can be used on shallow diameter gauges to check outside and inside diameters, undercuts, or recesses, and with other gauges permits almost any application which would normally require a less accurate long range model indicator. 1 illustr.

D *Wbbj.21*

Mesucora

Anon. *Mach Mod* 1961 Vol 55 (629) pp 103-112 (Aug) (In French)

The first Mesucora Exhibition is reviewed, and items of interest described. On the Goldring stand were displayed the Firth Brown hardness testers, with diamond indenters (Vickers), or ball indenters (Brinell), and the Coats hardness tester with diamond tip. The Société Forges de Vulcain exhibited the Taylor-Hobson Talysurf surface testing device, and Talyrond, roundness testing device, and the Reicherter hardness testers, Briviskop 3000-D (Brinell), and Brivo-Automat (Rockwell). Various illustr.

See also *Industr Diam Abstr* 1961 Vol 18 p A39 (Feb) ; A153 (June) ; A250 (Sep).

B *Nfs Wgf.27*

Metalworking report : cutting

Macklin Co. Jackson, Mich and the University of Michigan. *Amer Mach* 1961 Vol 105 (15) p 3 (July); *Mech Engng* Sep 1961 Vol 1 83 (9) p 83

A quick, dependable, and repeatable test of grinding wheel hardness has been developed by the Macklin Co Jackson, Mich and the University of Michigan. Small amounts of abrasive are crushed from the surface of a grinding wheel by rolling contact with a hardened steel wheel; then, the force exerted perpendicular to the wheel surface is measured with a dynamometer. With other variables held constant, crushing force increases with increased hardness, finer grit size, and closer grain spacing. Macklin is reported to have just marketed a commercial tester based on this principle.

D *Bf Ceg.1456.2232*

Development promises more uniform wheel grading

L. V. Colwell, R. O. Lane, K. N. Soderlund. *Grinding and Finishing* 1961 Vol 7 (8) pp 26-27 (Aug)

The results and probable outcome of a research project in wheel hardness are discussed. More accurate, quick, and economical grading of abrasive wheels on a production scale is forecast. 3 illustr.

D *Pe Qz*

Designation of surface roughness and the use of the ∼ sign

M. A. Baranovskii, V. N. Smolin. *Standartizatsiia* 1960 Vol 24 (5) pp 50-51 (May); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 802 (June) (Original in Russian)

D *Unf.21*

The Keinath Quality Factor, the accuracy of adjustment and friction faults in electrical measuring instruments —Pt 2. Betrachtungen über den Keinath-Gütefaktor, die Einstellsicherheit und den Reibungsfehler bei elektrischen Messgeräten—2 Teil

V. J. Bubert. *Feinw Tech* 1961 Vol 65 (8) pp 296-305 (Aug) (In German)

B *Wd*

Adjustable internal gage

N. A. Woodworth Co, Erin, Tenn. *Cutting Tool Engng* 1961 Vol 13 (6) p 65 (June)

The Snap-Plug eliminates many individual internal cylindrical plug gauges by having an adjustable range of from 2 to 4 inches. Conditions such as taper, bellmouth, and out-of-roundness can, it is claimed, be readily detected. Gauge pins are interchangeable and replaceable. Carbide tipped pins are available. 1 illustr.

D *Wbbg*

Optical measuring device checks .0025" dimensions

National Tool Co, 11222 Madison Ave, Cleveland 2, Ohio. *Mach Tool Blue Bk* 1961 Vol 56 (8) pp 246-247 (Aug)

A precision optical tool weighing approximately 4 oz is designed to measure dimensions as fine as 0.0025 in. without physically superimposing the reticle on the work. *D* *Wcz*

Measuring millionths

Anon. *Mech Engng, NY* 1961 Vol 83 (8) pp 40-42 (Aug)

The increased need to control tolerances of many critical components has caused machine tool manufacturers to request that the American National Bureau of Standards develop procedures for calibrating their master gauge blocks to an accuracy of 1 part in 10 million. 5,000 to 6,000 gauge blocks are calibrated by the Bureau each year. *D* *Qdd Wbbz*

New wear testing machine

A. G. Bobrov. *Mashinostroitel'* 1961 (3) p 21 (Mar); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 807 (June) (Original in Russian)

D *Wgm*

7th European Exhibition of Machine Tools : [air gauging equipment]

MPJ Gauge & Tool Co Ltd. *Mach Shop Mag* 1961 Vol 22 (9) p 511 (Sep)

A wide range of Sheffield Precisionaire air gauging equipment together with various types of measuring instruments embodying mechanical dial gauges and stick micrometers will be exhibited. Also the company's continuous gauging equipment for use in cylindrical grinding will be shown.

D *Wbbz.27.3235*

Checking pistons by air gauging

MPJ Gauge & Tool Co Ltd. *Mach Shop Mag* 1961 Vol 22 (8) pp 470-471 (Aug)

Describes this method of checking internal combustion engine piston dimensions. 3 illustr.

D *Agg Cz Qd Wbb*

Device for testing the quality of surface layers without cutting the product

A. P. Dobychina. *Vest mash* 1961 Vol 41 (4) pp 71-74 (Apr); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 802 (June) (Original in Russian)

D *Wgf*

Battery surface checker

Anon. *Canad Mach* 1961 p 97 (Aug)

It is claimed that model MS 1000 Surfindicator, for measuring surface finishes from one to 1,000 micro-in., can detect variations of ½ micro-inch. 1 illustr.

D *Wgf*

Surface treatment of sheet metal. Oberflächenbehandlung von Blech

Anon. *Metall* 1961 Vol 15 (8) pp 785-787 (Aug) (In German)

The Society for Research in Sheet-metal Working and the VDI Workshop-technique Unit held a joint conference on 16th and 17th May in Mainz. Amongst the subjects treated were 'The electron microscope and the technical elementary process' (Brüche) and 'The measurement of polish on industrial surfaces' (Lichthardt). *B* *Bfz Vs.231.322*

Provides absolute measurement to tenths

Anon. *Grinding and Finishing* 1961 Vol 7 (8) p 51 (Aug)

The DR-25B optical gauge is said to be accurate to 0.000025 in and is designed for routine production, especially when a number of dimensions must be checked on one part. 1 illustr.

D *Qd Wbbz*

How to improve tracer lathe accuracy — Part 3 — slides check

J.Bryan, J. Bowerbank, E. Holland, O. Mohl. *Tool Mfg Engr* 1961 Vol 46 (7) pp 87-91 (June)

The slides check measures how accurately the slides function to maintain rectilinear motion—the extent to which a slide maintains its angular orientation as it moves along its travel. The check is described and remedies for any errors discovered are suggested. The authors claim that although they may be time consuming, greatly improved lathe performance will have made the checks described in this series of articles worth while. 6 illustr.

D *Ceqb Pr Uqe*

Tape-Mike measures workpieces

Taper Micrometer Corp, 100 Grove St, Worcester, Mass. *Amer Mach* 1961 Vol 105 (14) p 137 (July 10)

Tape-Mike measures workpieces without removing them from the lathe with a reported accuracy of 0.00001 inch. The micrometer is said to be self-checking to 0.0002 in. or better. It is available from stock in four models to measure from 0 to 6 in. tapers. 1 illustr. *D* *Tz Ufd Wbd*

A discussion on the out-of-roundness of machined parts and its measurement

E. E. Lindberg. *General Motors Eng J* 1961 Vol 8 (2) pp 11-15 (Apr-May-June); *Bull Brit non-ferr Met Ass* 1961 Vol 41 (385) p 347 (Aug)

Definitions of out-of-roundness and use of V-blocks, ring gauges and precision spindle instruments to measure this quantity. Use of circular and strip charts to record results obtained by the last, and most effective, method. *D* *Az Ceq Vfd Wbb.21*

Precision index-center

Moore Special Tool Co Inc, Bridgeport, Conn. *Machinery, NY* 1961 Vol 67 (12) p 156 (Aug)

Is designed to achieve peak precision on form grinding of spiders, splined punches, gear die punches, and sectional parts of dies which must be resolved on centres or a spindle. *D* *Az Chcb Pr*

DAS 1,096,643 (Oct 4, 1954) **R. Böklen**

Method for determining the middle value of the resistance to indentation and of other properties of material to be derived therefrom of several depth measurements of indentations obtained when pressing indenters into solid bodies and device for carrying out the method. Verfahren zum Ermitteln des beim Eindrücken von Eindringskörpern in feste Körper auf Grund mehrerer Eindringtiefen zu bildenden Mittelwertes des Eindringwiderstandes und anderer, von diesem ableitbarer Werkstoffeigenschaften und Vorrichtung zur Ausübung des Verfahrens

Several indenters are pressed into the specimen simultaneously at different points the several indenters being coupled in such a way that the depth of indentation may be indicated or registered as a middle value or individually for each indentation. Fig 4 is a schematic representation of a device with two indenters 7, 8 indenting the specimen 9 to a depth t_1 and t_2

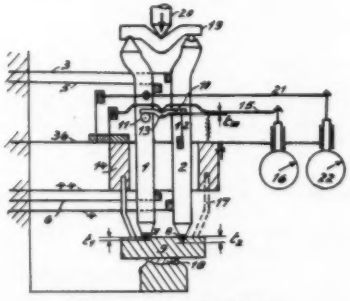


Fig 4. DAS 1,096,643.

respectively. A lever arrangement 13, 15 transmits the movement of the indenter plungers 1, 2 to dial 16 which then indicates the middle value of both depths. The movement of plunger 1 can be directly transmitted to dial 22 by lever 21. 8 claims, 4 illustr.

J *Cvd Unh.21.545*

TRUING OF GRINDING WHEELS

Newall-Keighley type BG precision plunge-grinding machine

Newall Engng Co Ltd, Newall Group Sales Ltd, Peterborough. *Machinery, Lond* 1961 Vol 99 (2540) pp 151-153 (July 19); *Metalworking Prod* 1961 Vol 105 (29) pp 69, 71 (July 19).

The machine will accept workpieces ranging from 3 to 10 in. in diameter, of plain cylindrical or profiled forms, and is equipped with a 20 in. diameter by 2 in. wide grinding wheel which is powered by a 10 hp motor. The wheel truing attachment is built into the wheel-head and provides for radius dressing, as required for plunge-grinding ball tracks in bearing inner races for example. The fine setting screw adjusts the diamond by 0.0001 in. it is claimed. A detachable setting gauge facilitates the adjustment of the diamond to the required radius for dressing curves. The truing cycle can be manual or automatic, and a second dressing attachment is available for truing the wheel parallel to the centre-line of the work. 4 illustr.

D *Chcd Nj Pr Psf*

Tool incorporates rotary motion, traverse dressing

Wheel Trueing Tool Co, Detroit, Mich. *Grinding & Finishing* 1961 Vol 7 (6) p 55 (June)

The Tru-Grit diamond-set rotary tool incorporates the advantages of rotary motion with traverse dressing of grinding wheels. It is claimed that a specific finish within a range of 30 to 50 r.m.s. can be maintained with this tool, and at the same time a taper-free straight surface within 0.0002 in. and geometrical roundness of the part diameter held within 0.0002 inch. 1 illustr.

D *Ab Cg Njz*

Grinding wheel loading minimized by ultrasonics

Cavitron Corp, Long Island City, NY. *Mach Tool Blue Bk* 1961 Vol 56 (8) pp 116-117 (Aug)

Some practical examples using the Ever-Grind attachment.

See also *Industr Diam Abstr* 1961 Vol 18 p A186 (July). 1 illustr.

D *Chcm Pr Psc Vwghb*

Dressing and centreless grinding combined. Dressage de forme et meulage ' centreless ' combinés

Van Norman Machine Co. *Mach-outil franç* 1961 Vol 26 (168) p 345 (Aug-Sep) (In French)

This machine combines roller dressing and centreless grinding to reduce machining time and facilitate accurate truing. The machine can be readapted to diamond dressing. 1 illustr.

B *Chcc Pr:Cgj Psf/Chcc Pr:Nj Psf*

Here's a design for a useful wheel grinding dresser.

J. Wain. *Canad Mach* 1961 p 88 (Aug)

D *Ab Cg Psf Qb*

Square faces on diamond wheels

A. Rakestraw. *Grinding & Finishing* 1961 Vol 7 (6) p 19 (June)

Question: How do you maintain square faces on diamond wheels?

Answer: There are two types of brake controlled diamond wheel truing devices: one designed with a brake to control the speed with which the truing wheel revolves on contact with the diamond wheel, the other has the truing wheel set at an angle in order that it's rotation provides a shearing action at a reduced speed. Either of these devices is applicable to cylindrical or surface grinding machines.

D *Chcl Nj Pr Psf/Chcm Nj Pr Psf*

Grinding wheel balancer

Balancing Equipment Inc, 1928 Broadway, Fort Wayne, Indiana. *Mod Mach Shop* 1961 Vol 34 (1) p 223 (June)

The balancer handles wheels of various sizes, including large centreless and cylindrical wheels, is portable and is said to offer savings up to 80% in balancing, without removing the wheel from the machine. 1 illustr.

D *Pe Psc Qq*

FP 1,229,346 **Zahnradfabrik Friedrichshafen AG** (July 6, 1959)

Device for truing profiled grinding wheels for grinding pinions with helical involute teeth. Dispositif pour dresser les meules profilées destinées à rectification de pignons à denture oblique à développante

The device comprises a truing diamond 10 which is guided along the helix on the base circle cylinder and on the straight generatrix of the helical tooth. During the helical movement the diamond 10, mounted on a rest 11, is caused to reciprocate in a straight guide rail 12 under the rotating grinding wheel. The rail is

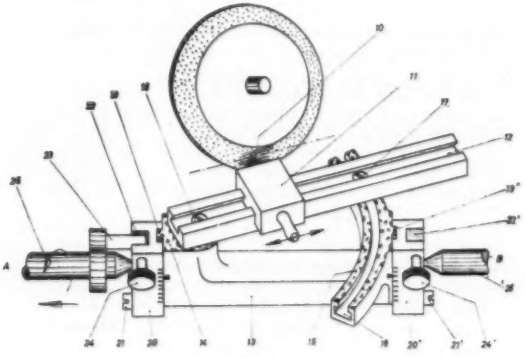


Fig 5. FP 1,229,346.

adjustably mounted on bearing surfaces 14, 15 of a support 13 and is inclined to the workpiece axis AB at the desired helix angle of the toothing to be ground. The support 13 is inserted, instead of the workpiece, between the headstock and tailstock centres 25, 26 of the grinding machine. Helical movement is transmitted from the headstock by a driver 23. By reversing the device between the headstock and tailstock it can be used for truing symmetrical grinding faces on the same grinding wheel or two symmetrically mounted wheels. Screws 21, 21′ and 24, 24′ permit adjustment of the base circle radius and of the tooth thickness. 2 claims, 1 illustr.

H *Abmd Cgf Nj:Ad Chc Pr.545*

FP 1,236,783 (Sep 24, 1959) **Soc d'Etudes et de Financements industriels**

Apparatus for the automatic diamond truing of a profiled grinding wheel. Appareil de diamantage automatique d'un profil de meule

In known automatically operated diamond truing apparatus the working face of the grinding wheel and only one of its rounded edges can be treated by the diamond tool so that two tools are required if both edges are to be treated. With the present device truing of the face and of both edges is effected with one tool only. The apparatus consists of a pivotable spindle carrying a diamond tool and mounted on a movable slide, the spindle and hence the tool being pivoted between two limiting angular positions defined by preset stops, by a hydraulically operated rack which moves parallel with the grinding wheel axis. The slide may be locked with, or unlocked from the rack for given angular positions of the spindle or diamond tool. At the beginning of an operation the grinding wheel is rotated and the tool is pivoted to treat one of the edges of the wheel. The slide then locks itself with the rack and the tool moves parallel with the wheel axis and trues its working face. After a predetermined travel corresponding to the width of the face the rack is unlocked from the slide and causes the tool to pivot further to treat the other edge of the wheel. 4 claims, 3 illustr.

H *Abm Cg Nj Psf.133.545*

DAS 1,093,251 (Jan 5, 1956) **K. Hack**

Truing device for the faces of grinding wheels for grinding machines for the ends of springs. Abrichtvorrichtung für die Stirnseiten der Schleifscheiben an Federendenschleifmaschinen

The truing tool is usually provided with small truing disks on a long spindle rotating at 10,000 to 22,000 rev/min. High centrifugal forces cause the lubricant to be thrown out of the support so that wear is excessive. The device is characterised by a turned-over rim at the end of the sleeve in which the spindle rotates and in which an oil space is formed between two cylindrical slide faces so as to prevent the loss of lubricant. 5 claims, 2 illustr. Ref cited : 2 GP ; 1 GM ; 2 Swiss P ; 6 USP.

J *Az Chc Pr Ab Cg Psf.545*

DAS 1,093,692 (Apr 21, 1955—France) **W. Ladinsky**

Cutting tool, in particular for truing grinding wheels. Schneidwerkzeug, insbesondere zum Abrichten von Schleifscheiben

The tool belongs to the class with parallel layers of diamond grains in a metal bond on a metal supporting plate and is characterised by diamonds in a sintered metal bond between two support plates. Fig 6 and 7

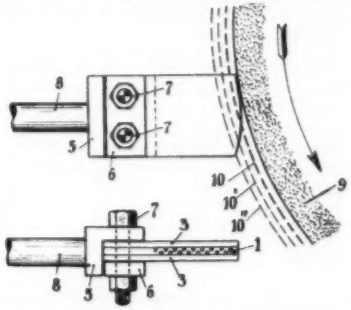


Fig 6 (above) and 7 (below). DAS 1,093,692.

show the diamond layer 1 between plates 3 clamped in 5, 6, 7 on shaft 8. One diamond after the other comes automatically into operation on wheel 9 while the tool is worn down. 2 claims, 9 illustr. Ref cited : 1 GP ; 1 DBP ; 2 Austrian P ; 1 Swiss P ; 1 FP ; 6 USP.

J *Ab Cg Nj.545*

DAS 1,095,159 (Oct 8, 1958) **H. Diekmann, Kugelfischer Georg Schäfer & Co**

Truing device for centreless grinders. Abrichtvorrichtung für spitzenlose Schleifmaschinen

The carrier of the truing diamond for the control wheel is arranged separately from the pivotable control wheel housing the diamond itself being adjustably inclined to the axis of the workpiece and guided parallel to the pivot plane of the control wheel housing. The slideway for the carriage with the truing diamond is pivotable about an axis parallel to and preferably in the same plane as the pivot axis of the control wheel casing. 2 claims, 2 illustr. Ref cited : *Prospectus* 1954.

J *Ab Cg Nj Psf:Chcc Pr.545*

Swiss P 350,176 (Nov 8, 1956) **A. Fumia, Gleason Works**

Truing device for a grinding wheel. Abrichtvorrichtung für eine Schleifscheibe

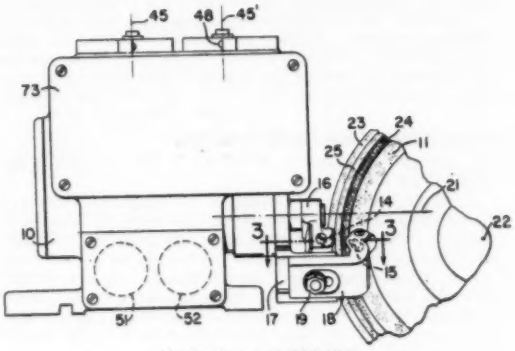
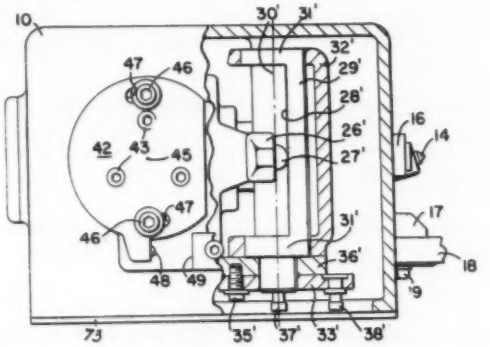


Fig 8. Swiss P 350,176.



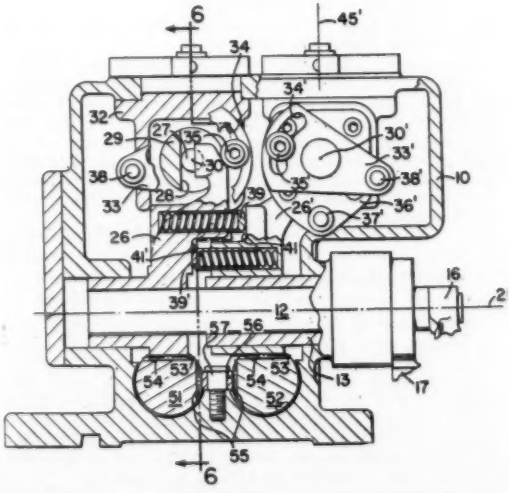


Fig 9 (top) and 10 (bottom). Swiss P 350,176.

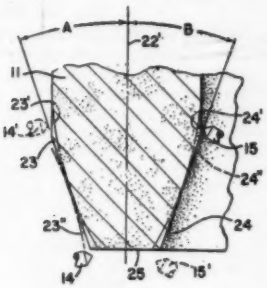


Fig 11. Swiss P 350,176.

The device is particularly intended for gear grinding machines. The tool carrier which is slidable in its holder in the direction of its axis engages a cam with a follower movable in an arc. The cam is adjustable around the centre of the arc in order to shift the tool in the direction of its axis in time with its oscillating movement. Fig 8 is an elevational view of the truing device, Fig 11 shows the position of the diamonds in the line 3-3 of Fig 8. The movement of arms 16 and 17 carrying diamonds 14, 15 is controlled by hardened ball followers 27 and 27′, Fig 9 and 10, on cams 29 and 29′. which are pivotable around horizontal axes 20 and 30′. The adjustment of cams 29 and 29′ around the respective axes 30 and 30′ is to be calculated trigonometrically according to certain conditions. The device is hydraulically driven by the movement of two pistons 51, 52 and two parallel racks 55. 11 claims, 7 illustr. *J* *Abmd Cg Psf.545*

DAS 1,096,721 (July 8, 1958) **J. Looman, Zahnradfabrik Friedrichshafen AG**

Device for truing profiled grinding wheels for grinding helical involute gear wheels. Gerät zum Abrichten von profilierten Schleifscheiben zum Schleifen von schrägverzahnten Evolventen-Stirnrädern

Fig 12 shows the device between the centre A-B of the grinding machine. Truing diamond 10 is reciprocated by hand on guide rail 12. After angular adjustment of the rail and of the height of carrier 13 in

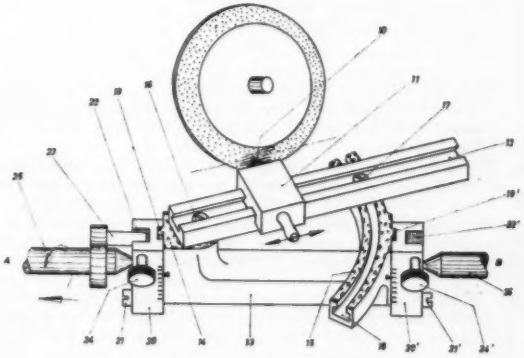


Fig 12. DAS 1,096,721.

slideways 19, 19′ so that the shortest distance between diamond point 10 and workpiece axis is equal to the radius of the root circle of the gear; the headstock movement is transmitted to the device as indicated by the arrows on headstock 25. 1 claim, 1 illustr. Ref cited: 1 GP; 1 BP. *J* *Abm Cg Nj.545*

DAS 1,098,395 **R. A. Mahlmeister, Sheffield Corp** (Jan 29, 1954—USA)

Method of truing a ribbed grinding wheel. Verfahren zum Abrichten einer gerippten Schleifscheibe

Diamond truing of wheels results in such fine ribbed grained wheel surfaces that heat dissipation is slow and therefore only slow grinding speeds are admissible. On the other hand diamond truing produces accurate profiles. The new method limits diamond truing to the outer portions of the ribs so that only the outer edges are accurately profiled while the roots are trued by a coarse truing device *eg* a crushing roller breaking off

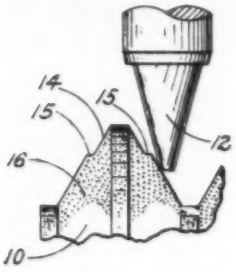


Fig 13. DAS 1,098,395.

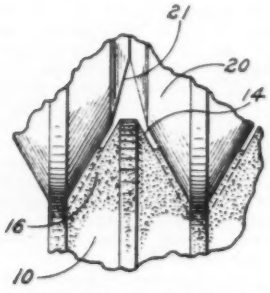


Fig 14. DAS 1,098,395.

the superfluous portions of the wider roots of the ribs. The crushing roller must not contact the diamond trued part of the wheel. Fig 13 shows diamond 12 after truing part 14 of wheel 10 and Fig 14 crushing roller 20 in contact with root portions 16. 5 claims, 5 illustr. Ref cited : 4 GP ; 1 Swiss P ; 1 FP ; 1 USP.

J *Abmd Cgf Nj.545*

DAS 1,099,893 (Dec 18, 1953—USA) **C. F. Voytech**

Device for truing the lapping surface of lapping machines. Vorrichtung zum Abrichten der Läppfläche bei Läppmaschinen

Lapping devices are often provided with workpiece holding rotatable rings of an outer diameter greater than the width of the ring face of the lapping disk. In operation not only rings and workpieces but also the lapping disk is subject to wear and to compensate for thus developing inaccuracies of the face of the lapping disk these rings can be shifted into another position. This, however, requires a highly skilled operator. A truing disk in a pendulum mount occasionally pressed against the lapping disk may also be used but interrupts the working process. This disadvantage can be overcome by the arrangement of one or several pressure rails with contact points in one plane which are placed over the rings in such a manner that the contact points between rails and rings are positioned in or near the radial planes through the rotational axes of the lapping disk and the holding rings. 6 claims, 7 illustr. Ref cited : 1 DBP ; *Mechanik & Maschinenbau* 1952.

J *Az Chd Pr Psf.545*

PRECISION MACHINING OF METALS

Diamonds precision finish memory drums

Anon. *Metalworking Prod* 1961 Vol 105 (33) p 13 (Aug)

To obtain the precise finish essential for magnetic memory drums, Sperry Gyroscope Co Ltd have adopted a diamond turning process instead of the previous grinding process. A very considerable saving in time and increased accuracy is said to have been achieved. The process of making the drums is described. 1 illustr.

D *Az Ceqb Nf*

Machine tools at the Soviet Exhibition

R. E. Green. *Machinery, Lond* 1961 Vol 99 (2541) pp 217-222 (July 26)

Machines described include a programme-controlled fine boring machine, an eight-spindle vertical automatic chucking lathe, and a universal thread-grinding machine, the wheel of which is dressed by means of a unit with three diamonds, either automatically or by push-button. The diamonds can be set so that two or three are brought into operation at the same time, and compensation for the material removed is made automatically. 8 illustr.

D *Njd Psf:Pr.27.33|Pr.27.33*

Russian machine tools at Earls Court

Anon. *Mach Shop Mag* 1961 Vol 22 (8) pp 460-465 (Aug)

A number of the more interesting machines exhibited at the Soviet Exhibition are described and illustrated. 8 illustr. *D* *Pr.27.33*

Methods employed for machining beryllium in an American plant

Anon. *Machinery, Lond* 1961 Vol 99 (2545) pp 442-443 (Aug)

3 illustr. *E* *Bfu Ceq.1456.342*

Machining missile parts to tolerances of 25 millionths

G. C. Close. *Mod Mach Shop* 1961 Vol 34 (1) pp 118-122 (June)

4 illustr. *D* *Az Ceq Pr*

Superfinishing aluminium and light alloys with a cutting tool. La superfinition à l'outil coupant de l'aluminium et des alliages légers

Anon. *La Pratique des industres mécaniques* 1961 Vol 47 (7) pp 174-176 (July) (In French)

The author obtained, by direct machining with a cutting tool, a very high quality surface finish claimed to be 3 times better than super-finishing, and 6 times better than treatment with diamond and truing. The process employs a tungsten carbide tool, the cutting edge of which is rectilinear, 2 to 10 mm long. The edge is finely sharpened on a diamond grinding wheel, since the finish produced is directly dependent on the quality of the cutting edge. 6 illustr.

B *Al Bkcb Chm Nv|Bfg Ceq Pdc Unf*

Flat within tenths—by milling

Anon. *Amer Mach* 1961 Vol 105 (14) p 85 (July 10)

Hand scraping is said to have been cut 50% and machining time 60% on beds for De Vlieg Machine Co's new line of Jigmils by using an Ingersoll adjustable-rail miller which produces bedways flat within 0.0001 in. per ft. over 24 ft. lengths. Cutting tools are kept sharp with an automatic Ingersoll cutter grinder, which regrinds all inserted-blade carbide cutters, producing tooth shapes, reliefs and clearances that are, it is claimed, consistent all around each cutter.

D *Alc Bk Chc Prs*

Carbide-tipped shearing knives

Ohio Knife Co. *Mach Tool Blue Bk* 1961 Vol 56 (8) p 213 (Aug)

Tungsten carbide tipped knives used in high speed cutting, shearing, and granulating are said to resist a high degree of abrasion and to maintain their cutting accuracy over long runs. 1 illustr.

D *Pdcbz Ungc/Pdcbz Uqe*

Factors affecting the choice of inserted-blade or throw-away tip milling cutters

F. Gable. *Machinery, Lond* 1961 Vol 99 (2545) pp 421-423 (Aug)

5 illustr. *E* *Cff Pdcb.18*

Solid carbide end mill for refractory metals

The Metal Removal Co, 1801 W Columbia Ave, Chicago 26, Ill. *Cutting Tool Engng* 1961 Vol 13 (6) p 65 (June)

The metal removal Master Mill is a new type solid carbide end mill for refractory metals of Rockwell 50C or harder. Because of its multiple number of teeth the mill retains its edge sharpness on refractory metals longer than a conventional 2 or 4 flute mill, according to the manufacturer.

D *Bfz Cff Pr Rg*

Carbide cutters for tape-controlled mill

Sonnet Tool & Manufacturing Co, 580 North Prairie Ave, Hawthorne, Calif. *Mod Mach Shop* 1961 Vol 34 (3) pp 189-190 (Aug)

A series of 'Helicarb' shank and shell end mills for tape-controlled milling machines has been announced. The carbide blades and the body of the cutter have interlocking serrations, which allow presetting in the toolroom, and resharpening without the necessity of cutting a new tape for the machine. 1 illustr.

B *Alc Bk Chc.1456/Cff Pr Wpb:Pdc*

A universal tool for machining operations

Maier & Co, Hallein, Salzburg, Austria. *Tooling* 1961 Vol 15 (8) pp 49-50 (Aug)

The 'Maximat Standard' consists basically of a lathe for turning and threading, but can also be used for milling, boring and grinding. The machine is claimed to be of particular value where the installation of several single purpose machines would be uneconomical. 2 illustr. *B* *Ceq Prs*

Production of the 'Simca Aronde'

Production de la Simca-Aronde

Anon. *Mach Mod* 1961 Vol 55 (629) pp 33-39 (Aug) (In French)

The article describes the machining of milometer pinions, differential drive pinions, and rear axles, and also the Reicherte Rockwell C hardness testing equipment used in the Poissy factory. 13 illustr.

B *Adz Ceq/Adz Cv Wghb*

Research into the vibration of machine tools considered within the general framework of the evolution of the machine tool. Les recherches sur les vibrations des machines-outils situées dans le cadre général de l'évolution de la machine-outil

Anon. *Mach-outil franç* 1961 Vol 26 (168) pp 223-241 (Aug-Sep) (In French)

The article is an extract of a report made by Prof J. Peters concerning research into machine tools carried out at the University of Louvain. 12 illustr.

B *Pr Qn.21*

Machinability of OFHC copper-II

Anon. *Amer Mach* 1961 Vol 105 (16) p 95 (Aug)

1 illustr. *E* *Bfh Unp*

The mechanics of chip formation

S. N. Agrawal, R. D. Harris, B. H. Amstead. *Machinery, Lond* 1961 Vol 99 (2541) pp 193-198 (July 26)

In an effort to secure more information on metal-cutting, a technique was evolved whereby basic data may be rapidly recorded, and subsequently analysed. The equipment and set-up (using optical and high-speed photographic apparatus) are described. The high speed film produced revealed that the tool face and chip flow bear some resemblance to a ship ploughing through water, and an analogy with hydrodynamic flow may be plausible. *D* *Bf Ceg Uqz.21*

DAS 1,095,082 (Oct 14, 1954) **L. A. Sayce, National Research Development Corp**

Machine for producing a helix of great accuracy in a cylindrical workpiece. Maschine zum Herstellen einer Wendel grosser Genauigkeit in ein zylindrisches Werkstück

This machine is an improvement on the known machines for producing inclined diffraction gratings by cutting a master helix as a lead screw, *eg* on a lathe, and transmit the movement from this helix to the cutting diamond through a soft resilient shoe covering a number of threads so as to compensate for periodical or other inaccuracies in the master helix. In the new

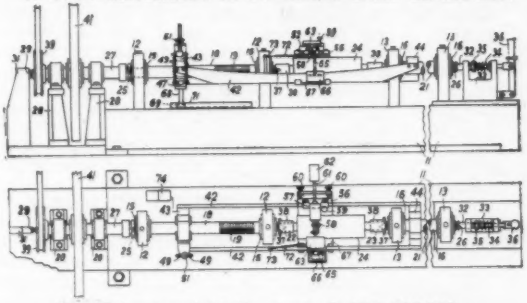


Fig 15 (top) and 16 (bottom). DAS 1,095,082.

machine the lead screw carrier and a cylindrical part, rotating with the lead screw and carrying a bridge with the cutting device, are independently supported. Fig 15 and 16 are an elevation and plan of the machine. Fig 17 shows the arrangement of the diamond cutter 53 which is counterbalanced by 62 and whose movements are damped by dash-pot 66. In Figs 15 and 16, 18, 19 is the lead screw carrier, 21 is the cylindrical part, and 42 is the bridge consisting of a pair of girders. The pressure of the cutting diamond is only a few grammes and the workpiece can have a larger diameter than the lead screw which is a great advantage. The thread may be cut into a coating of a synthetic material on a metal cylinder to be stripped off the cylinder afterwards and cut into strips. Or the cylinder may be glass or quartz with a coating of gold into which the thread is cut.

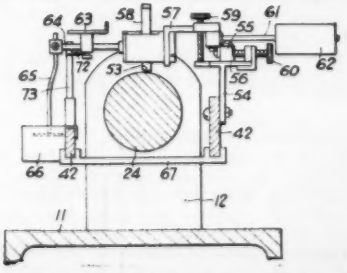


Fig 17. DAS 1,095,082.

1 claim, 5 illustr. Ref cited : 1 GP ; 2 DBP ; *Proc roy Soc 1952.* *J* *Ag Ceqbd.545*

BP 860,478 (Dec 23, 1957) **R. Hanning**

Cutting tool having an inserted cutting tip

Cutting tips are soldered to a steel tool holder or clamped on, sometimes held in a recess first expanded by heat and then shrunk around the tip. However all these methods easily lead to damage of the brittle tip. Any such danger is avoided by casting around the tip a material of which the density is greater when the material is in a fluid state than when it is solid. Bismuth or an alloy of bismuth is such a material which on solidifying expands and thereby holds the cutting tip with a uniform distribution of pressure. 3 claims, 2 illustr. *J* *Pdcb.545*

CUTTING AND MACHINING OF STONE, GLASS, ETC.

Machining plastics

G. C. Carlyon *Tool Mfg Engr* 1961 Vol 46 (7) pp 99-100 (June)

The four thermoplastics covered are Nylon, Teflon, Acetal and Lexan polycarbonate. Tables are given showing correct tool geometry, speed and feed when performing the various machining processes on them. Because they melt at lower temperatures than metals, frictional heat build-up should be avoided; this calls for sharp tools and a modified tool geometry, plus suitable coolants. Carbide tools are said to perform well and should be diamond lapped. Grinding is not difficult as long as open grit wheels are used with adequate coolants and light feeds. 7 tables.
D *Al Bk Chd Nv/Bpz Ceq Pdc*

Diamond disks cut expansion joints in concrete runways

Anon.. *Purchasing Week* 1961 Vol 4 (32) p 36 (Aug)

150 standard Engelhard Hanovia metal-bond diamond wheels were used in the cutting of 88 miles of expansion joints in two 11,500 ft runways and adjoining taxi strips at the Dulles International Airport, near Chantilly Va. Depths of the ¼ in. wide joints varied according to total depth of concrete, but were between 2 and 3 inches. Cutting speed was about 6 ft/minute.
D *Az Ceg Nv Urc*

Masonry saw

Felker Mfg Co. *Ceram Age* 1961 Vol 77 (6) p 20 (June)

The Maintenance-Man Jr is a compact masonery saw weighing 110 lb including motor and head. It will cut wet or dry and uses either diamond or abrasive blades. Blade height may be locked for diamond blade cutting or can be adjusted by handle for rocking cuts.
E *Bn Cej Ng*

Centreless grinding of rubber

Arthur Scrivener Ltd, Tyburn Rd, Birmingham 24. *Tooling* 1961 Vol 15 (8) p 79 (Aug)

A series of rubber parts are being currently ground on a Scrivener Number 3 centreless grinder. 2 illustr.
B *Az Bq Chcc Pr*

Apparatus for cutting glass

M. T. Proskuriakov. *Lab delo* 1961 Vol 7 (3) pp 56-57 (Mar); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 673 (June) (Original in Russian)
D *Bm Ceg Pr*

Engraved glass by American craftsmen

E. M. Elville. *Glass* 1961 Vol 38 (3) pp 123-126 (Mar) 5 illustr. *E* *Bm Cp.342*

FP 1,232,388 (Apr 20, 1959) **Centre Nationale de la Recherche Scientifique**

Simple machine for cutting thin disks from rocks. Machine simple pour la taille des plaques minces de roches

The preparation of 0.01 to 0.04 mm. thick plates cut from rocks for examination under the microscope is usually carried out by fixing thicker plates on glass plates and maintaining the assembly by hand or various mechanisms on the plane surface of a stone grinder which may be supplied with an abrasive suspension or which may be studded with diamonds. Due to friction between the surfaces in contact it is difficult to maintain the required pressure and speed of rotation for preventing separation of the plates and to reciprocate the plates on the grinder for providing uniform wear thereof. The apparatus shown in Fig 18 and 19 comprises a diamond

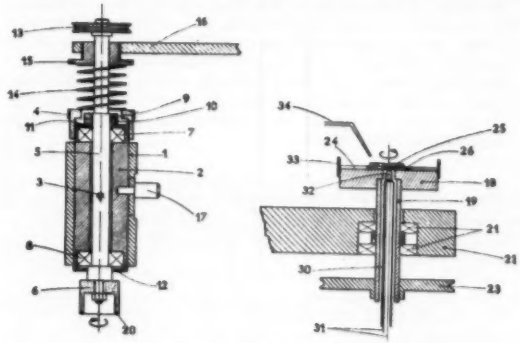


Fig 18 (left) and 19 (right). FP 1,232,388.

or abrasive cup wheel 20 secured to a shaft 5 rotatable in ball bearings in a spring loaded, vertically adjustable housing 2. The plate assembly 25, 26 is supported on a chuck 18 revolving about an axis eccentered with respect to the wheel axis and provided with a source of light 32 for examination of the plate under the microscope. 1 claim, 3 illustr. *H* *Bn Cej Pr.545*

FP 1,235,832 (Sep 24, 1958—Germany) **W. Hennings, E. Zimmermann**

Method and device for cutting glass tubes. Procédé et dispositif pour découper des tubes de verre

In an apparatus for cutting glass tubes of small diameter and relatively great wall thickness into individual lengths, the tube is secured into a holder which is rotated while a scoring device, such as a rotating diamond cutting wheel, is automatically brought against the tube and scores the glass along a peripheral line. The scoring device is then withdrawn, the tube is brought to rest and a flame is applied at a point on the score line. The resulting local temperature increase causes separation of the length of the tube without formation of jagged edges or splinters. 2 claims, 3 illustr. *H* *Ag Bm Ceg Psc.1456.545*

DAS 1,088,865 (Oct 24, 1955) **A. Stihl**

Sawing chain for stone. Sägekette für Gestein

Sawing chains as used up to now have not been satisfactory because the brittle hard metal teeth frequently cracked or broke away from their mountings. The reason is that such teeth are designed to produce chips as when sawing timber and hard stones cannot yield such chips. The chain as described is provided with cutting "pearls" known *per se, ie* the hard metal is applied as a powder or in granular form to the surface of a relatively soft material *eg* welded on or

pressed in as a thin layer. The cutting pearl is mounted for slow rotation so as to combine a sliding and rolling movement. Worn pearls are not reground but thrown away and replaced by clamping new pearls into their mounts in the chain. It is possible to cut deep grooves into a stone with a portable tool while previously such work could only be carried out in heavy sawing machines with large diameter saws. 11 claims, 13 illustr. Ref cited : GP 706,560.

J *Bn Ceg Pdz.545*

GEM POLISHING

Sparkling facets

V. Starikov. *Ogonek* 1961 Vol 39 (15) pp 10-14 (Apr) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 724 (June) (Original in Russian)

D *Gs.21*

Facet angles for brilliant cutting of natural and artificial gem stones

J. Sole. *Sklar Keram* 1960 Vol 10 (4) pp 97-101 (Apr)

The angle of cut is a fundamental factor of the brilliance and colour of the stone. The angles generally used are studied from the point of view of refractive index and tables and formulae are given for best values.

D *Bb Ceg Ubh/Bb Ceg Ukb/Bb Ceg Ukcz*

The ideal shape for diamond cutting. Die Idealform des Diamantschliffes

Anon. *Fachkunde am Ladentisch, Supplement to Dtsch Uhrmacher Zeits* 1961 Vol 65 (8) Blue Page 1 (Aug) (In German)

The article discusses the shape best suited for a diamond, *ie* the shape which produces most life and fire in the cut stone. *B* *F Hn Kbb*

Start of polishing early jewellery in Europe

S. Tolansky. *Diamond News* 1961 Vol 24 (10) pp 10-11 (July)

The development of diamond polishing and cutting theory and practice, from the early 14th century to the persent day, is outlined. Due to its rather conservative nature, the industry has been unenthusiastic towards the latest technological advance : the use of X-rays for accurately locating the correct crystal planes on the diamond, so as to orient the crystal very precisely to secure optimum grinding conditions.

D *F Ubc Ujf*

Jewelry and watch manufacture and trade techniques

S. A. Selivankin, S. V. Tarasov. *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 693 (June) (Original in Russian)

Book, Gos izd-vo torg lit-ry, Moscow, 1960, 222 pp. [Not in library of Industrial Diamond Information Bureau]. *D* *Bb Qc/Bb.1456.251*

Studies of sapphire surfaces yield useful facts about oxide systems

Anon. *Engng Res News of N Carolina State College* 1960 Vol 11 (1) p 1 ; *Brit ceram abstr* 1961 (5) pp 213A, 214A (May)

Experiments with polished and thermally-treated surfaces of sapphires have demonstrated the marked influence of surface preparation and treatment on the observable micro-properties of the material. Preliminary polishing of sapphire surfaces was carried out using a rotating wood-faced lap charged with diamond dust.

B *Az Bbd Chm Km/Az Bbd.21*

ROCK DRILLING

The second full session of the Central Committee of the Syndicate for Geological Prospecting, Moscow Sep 6/7, 1960. La IIe session plénière du Comité central du Syndicat de la prospection géologique

Anon. *Prosp prot sous-sol* 1960 (11) pp 51-57 (Nov) (In French, original in Russian)

Mention was made during the meeting of the need to improve the technique of prospecting. To do so, it was intended that diamond drilling and compressed-air drilling be used in prospecting for hydrocarbons. Diamond drilling equipment was being perfected, and instructions for its use would be prepared.

B *Bhbz.12:Nh*

Diamond tips

G. S. Vil'ner. *Standartizatsiia* 1961 Vol 25 (1) pp 50-52 (Jan) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 639 (June) (Original in Russian)

D *Ndz.255*

Diamond boring machines

E. S. Aktova. *Standartizatsiia* 1961 Vol 25 (1) pp 47-48 (Jan) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 643 (June) (Original in Russian)

D *Cfd Nf*

The OS-314 special diamond boring machine

V. I. Shekhter. *Biul tekh-ekon inform* 1961 (3) pp 28-30 ; *Library of Congerss Mthly Index Russ Access* 1961 Vol 14 (3) p 643 (June) (Original in Russian)

D *Cfd Nf*

Wear resistance of Russian small diamond drills

V. E. Kopylov. *Izv vys ucheb zav geol i razv* 1960 (11) pp 123-127 (Nov) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (2) p 345 (May) (Original in Russian)

D *Nh.33:Ungd*

Pneumatic PDZ-1 bit dressing machine

L. I. Byl'skii. *Gor zhur* 1960 (5) pp 49-50 (May) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 607 (June) (Original in Russian)

D *Alb Cg Prz*

Hydraulic SDG-1 bit-dressing machine

Z. B. Volodarskii, A. D. Ikol. *Gor zhur* 1960 (5) pp 50-51 (May) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 607 (June) (Original in Russian)

D *Alb Cg Prx*

Mindrill Overseas Activities

Anon. *Mindrill Bits & Pieces* 1961 Vol 14 (6) p 5 (June)

Drilling with Mindrill diamond bits and equipment is being carried out at Bhakra Dam, approximately 230 miles from New Delhi. This is being done in reinforced concrete, in which the steel diameter varies from ¼ to 3 in., for grouting purposes. Mention is made of some other areas in which diamond drilling is being carried out, including Ceylon. 2 illustr.

D *Bnt Cfb Nhb.371*

Drilling at Cligga

Anon. *Min J* 1961 Vol 257 (6575) p 200 (Aug)

A few diamond drill holes have been drilled to comparatively shallow depths at Cligga, Cornwall and the results are said to have been sufficiently encouraging to warrant further expenditure on exploration for tin.

D *Cfb Nh.321*

Attack on the centre of the earth

G. I. Pokrovskii. *Sov voin* 1961 Vol 43 (4) pp 28 30 (Feb); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (2) p 345 (May) (Original in Russian)

D *Bnt Cfb*

FP 1,230,472 (Dec 5, 1958) **A. Houpeurt, Institut Français du Pétrole, des Carburants et Lubrifiants**

Drilling method. Procédé de forage

Drilling speed can be considerably increased by providing an annular cavity at the periphery of the bottom of the bore before the core portion is drilled. It is thought that the part of the rock forming the core is thereby free from compression sustained by the remainder of the rocks so that it offers less resistance to the drilling tool and can therefore be easily disintergrated. Diagrams of the three types of tool are given which allow drilling of the annular cavity to take place at the same time as and ahead of that of the core portion. 6 claims, 3 illustr.

H *Cfb.1456.545*

FP 1,230,512 **A. Houpeurt, L. Issenmann** (Mar 4, 1959)

Drilling tool. Nouvel outil de forage

In drilling bore holes with known diamond tools it is found that the core offers more resistance to the tool than the periphery of the hole. With very hard rocks the core constitutes a tool supporting pivot which must break before the tool can advance further. With the present tool normal wear of the core takes place so that drilling speed is increased. It consists of a conventional diamond crown provided internally with a movable member having at its lower end a diamond impregnated working face and connected to the crown at its upper end by means of a ball and socket joint, a cardan joint or by resilient means. Various forms of the movable

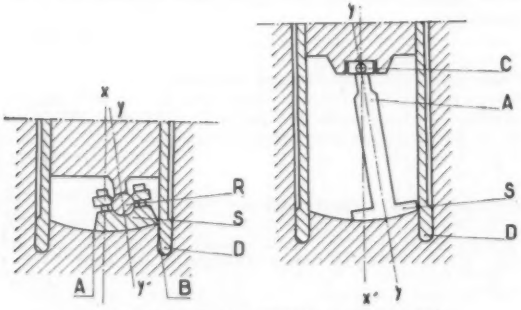


Fig 20 (left) and 21 (right). FP 1,230,512.

member are illustrated. For example, in Fig 20 the movable member S is connected to the crown D by ball and socket joint R, its working face AB being spherical, plane or concave. In Fig 21 the member S is connected by a cardan joint C to a shaft A provided with ball bearings V and connected to the crown D by a ball and socket joint R. 2 claims, 7 illustr.

H *Pl.21.545*

FP 1,233,626 (May 5, 1959) **R. M. Moreau J. K. Smit & Fils**

Drilling tool. Outil de forage perfectionné

The operation of known diamond drill bits can be compared with that of grinding tools in that they offer endwise contact to the surface they must penetrate. The drill bit of the present invention, on the other hand, is comparable to a milling cutter. Fig 22 is a vertical

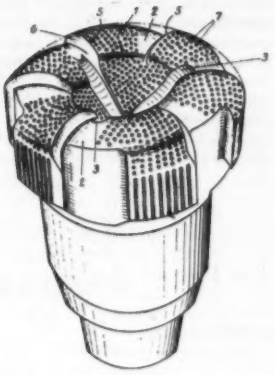


Fig 23. FP 1,233,626.

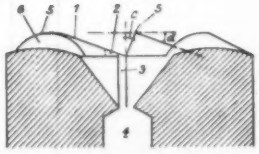


Fig 22. FP 1,233,626.

section of the bit and Fig 23 is a perspective view. The bit comprises a toroidal working surface sub-divided into sectors 1 spaced apart by recesses 2 for removal of the cuttings, every other recess being connected with a groove 3 through which coolant fed through the bore 4 circulates. Each sector is raked rearwardly from its cutting edge 5 towards the recess 2. A bevelled face 6 extending from the edge 5 provides a negative cutting angle. With such a design pressure decreases rapidly from the cutting edge towards the recess 2, allowing a progressive reduction of diamond studs on the working face in the same direction. 3 claims, 4 illustr.

H *Cfb Nh.545*

FP 1,233,721 **Bolidens Gruvaktiebolag** (Dec 9, 1958—Sweden)

Diamond drilling machine. Machine perforatrice à diamant

The machine illustrated is specially adapted for use in quarrying and mining. Fig 24 is a vertical sectional view of the machine for drilling horizontal bore holes and Fig 25 is a plan view. A drill string supporting a diamond drill bit 1 is coupled to the shaft of an electric motor 2 mounted in guides 6 and reciprocable thereon by a hydraulic feeding mechanism 5. The guides are pivotably mounted on a plate 8 anchored in the rock by means of a mandrel 9 adapted to expand in a preformed hole in the rock face and to take up the drill pressure. The guides may be pivoted by means of a

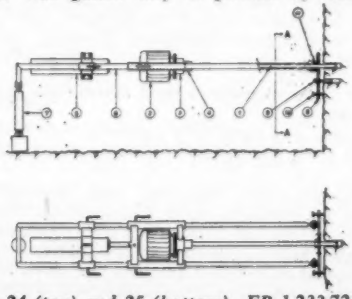


Fig 24 (top) and 25 (bottom). FP 1,233,721.

hydraulic device 7 for removal or exchange of the drill string after disconnection of the latter from the motor. In another illustration the machine is shown adapted for vertical drilling, the guides forming the pillars of a hydraulically pivotable derrick crane and the drill string being removed by a cable on pulleys mounted on the crane. 2 claims, 4 illustr.
H *Cfb Nh.545*

DAS 1,094,687 (Oct 12, 1957) **H. Hügel, Tiefbohr- Mess- Dienst Leutert & Hügel GmbH**
Core drill for obtaining oriented cores several portions of which are oriented independently of each other. Kernbohrer zum Ziehen von orientierten Bohrkernen bei denen mehrere Abschnitte unabhängig voneinander orientiert sind

It is often important to know the direction of layers, disturbances, shales, *etc* with respect to North and many inventions have tried to solve this problem, mainly by determining an angle between a mark on the core and the magnetic North. But this means the obtaining of several cores to make sure that the core was not torn or turned which might have falsified the result. This can be obviated by a drill which is so designed that successively at predetermined periods a mark is made to fix the azimuth of a certain cross section radius and also the deviation of the longitudinal axis of the drill and thus of the double core tube from the vertical. This is *eg* made possible by the arrangement of several internally projecting cutting edges with unequal angular spacing to produce marks alonge the core. 4 claims, 5 illustr. Ref cited : 1 USP.
J *Cfb Plb.545*

WIRE DRAWING

The twentieth century renaissance in the steel wire industry
A. M. Reeder. *Wire & Wire Prod* 1961 Vol 36 (8) pp 991-994 (Aug)

The development of the tungsten carbide wire-drawing die by the German Osram Co, late in the First World War, came at a time, it is stated, when diamonds were difficult to obtain. Its general appearance in the late nineteen twenties is said to have been one of the greatest factors in the renaissance of the wire industry, making possible the present automation in wire production.
D *An Bfcb Cn Nkb*An Bfcb Cn Pxb*

Die polisher
The Parker-Hartford Corp. *Mach Tool Blue Bk* 1961 Vol 56 (8) p 242 (Aug)

A die polishing machine for grinding and polishing contact surfaces of carbide and steel round core extrusion and draw dies utilizes an endless abrasive belt driven at 5,000 rev/minute. An angle polishing fixture is featured which will maintain, it is claimed, die manufacturers' specifications on approach, back relief angles, and bearing angles with highest accuracy.
D *Ax Chc Pr/Ax Chm Pr*

Extruding brazing wire to 1/32 inch in diameter
Anon. *Mod Mach Shop* 1961 Vol 34 (2) pp 124, 126 (July)
B *Cn.21*

GRINDING AND POLISHING OF CARBIDES AND METALS

New requirements in grinding wheel evaluation
C. Highberg. *Cutting Tool Engng* 1961 Vol 13 (6) pp 24-26 (June)

Although much progress has been made in the gathering of information on grinding wheel performance, the article says much more is needed. It discusses comprehensive testing requirements, and reports on tests that the Indusrtial Diamond Division of Engelhard Hanovia, Inc, have carried out. 2 illustr.
D *Nv Uqe.21*

Spending enough on grinding ?
R. L. McKee. *Grinding & Finishing* 1961 Vol 7 (6) pp 25-26 (June)

Modern grinding machines allow for more complex generation of forms and increased stock removal, making grinding a more economic operation than may be generally realised. 1 illustr.
D *Chc Pr.1451*

Effect of technological factors on the efficiency and surface smoothness in lapping with abrasive pastes
M. S. Kliatskii. *Nauch zap KHIMSKH* No 11 *Fa mekh sel' khoz* 1958 (1) pp 109-130 ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 677 (June) (Original in Russian)
D *Chd Rdc Unf*

Proper sharpening means longer tool life, Part 2
W. H. McNeilly. *Cutting Tool Engng* 1961 Vol 13 (6) pp 17-19 (June)

Gives detailed suggestions for grinding carbide cutters, specifying type of grinding wheel, *ie* giving size, concentration, and type of bond for each particular operation. 2 illustr.
D *Al Bk Chc Pe Ur*

Sectional abrasive disk with automatic regulation of the pressure on machined surface
A. P. Chernousenko. *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 677 (June) (Original in Russian)

Booklet : Leningradskii dom nauchno tekhicheskoi propagandy, Obmen peredovym opytom. Seriia Mekhanichieskaia obrabotka metallov, Leningrad, 1960, 16 pp.
[Not in library of Industrial Diamond Information Bureau]. *D* *Az Ceq Pez.52*

Abrasive machining in the space age
B. R. McDonnell, sen. *Grinding & Finishing* 1961 Vol 7 (6) pp 32-35 (June)

As an example of the highly complex machining operations called for in producing missile components, the manufacturing sequence of a hydraulic sleeve and slider unit for a servo-control unit is detailed. The very extensive grinding, honing and lapping operations to close tolerances are described. 11 illustr.
D *Az Chc Pr/Az Chd Pr/Az Chh Pr*

Metalworking report : cutting
Anon. *Amer Mach* 1961 Vol 105 (14) p 2 (July 10)

Diamond wheels may be the best way to grind some tool steels, according to tests made at the Diamond Application Laboratory of GE, and confirmed by some field results. Although 150 times as expensive as aluminium oxide, diamonds proved cheaper for most of the higher vanadium steels tested because of faster stock removal and longer wheel life.
D *Bfcbz Chc Nv.1451*

On the analysis of random errors in precision grinding operations

R. S. Hahn. *J of Engng for Industry* 1961 Vol 83 (2) pp 131-141 (May)

D *Chcw.21*

Automatic contour super finishing

F. W. Armytage. *Glass Technol* 1961 Vol 2 (4) pp 130-132 (Aug)

This paper comments on the surfaces finishes produced on glass moulds by conventional methods and describes the advantages of honing and particularly automatic contour honing in producing super finishes. Surface finishes of 1 micro-in. can, it is claimed, be produced and accuracies of 0.00001 in. are possible. 1 illustr.

D *Az Bm Chhz Prs Unf*

Metalworking report : finishing

Anon. *Amer Mach* 1961 Vol 105 (14) p 4 (July 10)

Diamonds are ideal for burnishing almost all materials except titanium, General Electric concludes from recent experiments. Diamonds have a coefficient of friction one order of magnitude lower than unlubricated metal-to-metal contacts, and they may be polished to a surface finish if less than one microinch. GE reports that fatigue strength of the work is greatly increased, and complete work hardening is achieved.

D *Bf Chmz F Ungb*

New resinoid diamond wheel bond

Precision Diamond Tool Co, Elgin, Ill. *Grinding & Finishing* 1961 Vol 7 (6) p 42 (June)

A new method of attaching diamond to the bond chemically, instead of merely mechanically, claims to increase grinding efficiency and decrease wheel wear. Results of dry and wet grinding tests, which have been substantiated in the field tests, show the 'BH' bond to be superior to the firm's own resinoid bond.

D *Nv Urb*

New grinding wheel concept

Anon. *Grinding and Finishing* 1961 Vol 7 (8) p 53 (Aug)

Called Agrabond this combination resilient rubber bond wheel is said to have the metal removal qualities of a rigid resinoid wheel and the finishing properties of a flexible polishing wheel. *D* *Pe Urg*

Differences in structure in ceramically bonded grinding wheels

S. Büchner. *Interceram* 1960 (2) p 101 ; *Brit ceram abstr* 1961 (5) p 198A (May)

Properties required by an abrasive body according to DIN 69 100 are discussed.

B *Pe Urf.21*

Nylon polishing belt

Armour Alliance Industries. *Metal Progr* 1961 Vol 80 (1) p 25 (July)

A nylon abrasive belt, with aluminium oxide or silicon carbide abrasive grain sizes from coarse to superfine, has been introduced. It is claimed that these belts outlast other coated polishing belts, and produce a micro-finish never before possible.

B *Peez Rgc Ungf/Peez Rj Ungf*

New tungsten steel provides longer tool life in compacting abrasive ferrite powders

IBM Corp. *Mod Mach Shop* 1961 Vol 34 (3) pp 114-116 (Aug)

The holes in the punches used to compact extremely abrasive powdered iron-oxide are ground to within ±0.0001 in. using a diamond wheel. 2 illustr.

B *Alm Bfxk Chc Nv*

How to machine industrial thermoplastics

Anon. *Metalworking Prod* 1961 Vol 105 (34) pp 54-59 (Aug 23)

High-speed steel tools are generally used in machining plastics, but carbide tools are recommended for long production runs. Tools should be honed on a diamond wheel with grit between 240 and 320. Under these conditions, it is said smooth surfaces are easily achieved on heavy as on light cuts. 2 illustr, 3 tables.

E *Al Bk Chh Nv/Bp Ceq Pdb*Bp Ceq Pdc*

Kinematics and dynamics of the lapping-in of external cylindrical surfaces

A. I. Glazunov, A. T. Poletskii. *Vest mash* 1961 Vol 41 (2) pp 50-55 (Feb) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 677 (June) (Original in Russian)

D *Agz Chdz.21*

Discover vibratory finishing

W. E. Brandt. *Machinery, NY* 1961 Vol 67 (12) pp 81-89 (Aug)

Describes the new finishing process for removing heavy scale, burrs, flash, and general cleaning and burnishing. 14 illustr.

D *Chm Qn.1456*

Agglomerated abrasive products : the modern tool. XI. The grinding wheel in industry. Les produits abrasifs agglomérés : outil moderne. XI. La meule dans l'industrie

G. Winning. *Mach-outil franç* 1961 Vol 26 (168) pp 307-313 (Aug-Sep) (In French)

The uses, lubrication, and dressing of grinding wheels, and the materials machined by them are discussed. 6 illustr. *B* *Ab Cg/Pe Qr/Pe.1451*

Jig grinding : versatility in the die shop

F. C. Victory. *Grinding and Finishing* 1961 Vol 7 (8) pp 22-25 (Aug)

The basic principles and scope of jig grinding are outlined and hole and taper grinding procedures are described. 5 illustr. *D* *Az Chc.21*

New wheel design—new savings

F. W. Lindblad. *Cutting Tool Engng* 1961 Vol 13 (6) pp 20-23 (June)

When using the popular type D11V9, 3½ in. or 5 in. flaring cup wheel on a No 2 Cincinnati tool and cutter grinder, which, it is stated, probably accounts for at least 60% of all diamond wheels used for sintered carbide and ceramic grinding in production industries, the use of a wet coolant is virtually impossible. The Turbo-Grind design utilises vanes in the centre of the wheel to create air turbulence which has a cooling effect on the wheel and the workpiece. It is nevertheless emphasised that on no account should cuts over 0.001 in. be made on any wheel, as heavier cuts heat the bond to disintegration with consequent loss of wheel life. 4 illustr.

D *Al Bkc Chc Pr:Nvf/Al Bl Chc Pr:Nvf*

What you should know about bond types

R. L. McKee. *Grinding & Finishing* 1961 Vol 7 (6) pp 36-39 (June)

Describes the manufacture and application of the various types of bond. Vitrified bonded wheels account for about 50% of all grinding wheels and are used for nearly all types of grinding operations. Resinoid bonded wheels account for a further 30% and are mainly used for high-speed roughing operations, while rubber-, shellac-, silicate- and oxychloride bonded wheels all have rather more specific applications. 6 illustr. *D* *Urb.21/Urf.21*

Surface finish of gears hardened by " abrasion " or profile forming. Finitura degli ingranaggi temprati con " abrasione " o rodaggio dei profili

C. Macabrey. *Macchine* 1961 Vol 16 (8) pp 793-797 (Aug) (In Italian)

7 illustr.

M *Tz Unf*

Using diamond wheels for lapping cutters

N. I. Kangin. *Mashinostroitel'* 1961 (4) p 34 (Apr); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 677 (June) (Original in Russian)

D *Al Chd Nv*

Finish machining missile nose cones

Anon. *Mod Mach Shop* 1961 Vol 34 (3) pp 110-111 (Aug)

Dual motor belt sanders, it is claimed, have halved the finishing time on the nose cones of the Nike-Hercules missiles. 1 illustr.

B *Az Chct Pee*

Grinding wheels in the foundry industry

S. M. Gray. *Brit Foundryman* 1961 Vol 54 (5) pp 239-243 (May); *Bull Brit non-ferr Met Ass* 1961 Vol 41 (385) p 348 (Aug)

High speed cone wheels and mounted points; reinforced resinoid wheels; floor stand and swing-frame grinders.

D *Az Chc Pr/Pe Urb.21/Pe.21*

Profile grinding at the Gorkiy Automobile Plant

V. IA. Frolov. *Biul tekh ekon inform* 1961 (3) pp 32-34; *Library of Congress Mthly Russ Access* 1961 Vol 14 (3) p 677 (June) (Original in Russian)

D *Az Chch.2635.33*

Form grinding of V-shaped cutters

T. L. Ryzhakova. *Mashinostroitel'* 1961 (3) p 37; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 677 (June) (Original in Russian)

D *Alz Chcb*

7th European Exhibition of Machine Tools: [gear production equipment]

David Brown Industries Ltd. *Mach Shop Mag* 1961 Vol 22 (9) pp 501-502 (Sep)

A wide range of gear production equipment will be exhibited including gear hobbing machines, a gear shaving machine, an involute and helix measuring machine and also a new hob sharpening machine designed to accommodate hobs up to 6 in. diameter and 12 in. long and this capacity can be utilised with an appropriate gauge to sharpen, say, three 4 in. hobs at one mounting. Hobs with from 4 to 36 gashes can be sharpened. 1 illustr.

D *Ad Cfp Pr.27.3235*

Churchill automatic internal and face grinding machine

Churchill Machine Tool Co Ltd, Broadheath, Manchester. *Mach Shop Mag* 1961 Vol 22 (8) pp 485-486 (Aug)

With this model, the HBM, an external face can be ground square with the bore of the component, both operations being carried out automatically. Provision is made for vertical adjustment of the wheelhead, to enable the face grinding wheel to be positioned so that the face of the component is effectively covered during the grinding operation. The truing diamond is arranged so that the facing wheel is dressed with a relief to reduce the contact area with the work and also to provide a cutting edge. The model has a swing capacity of 19 in. diameter over the table and 12 in. diameter inside the work guard. Bores up to 8 in. diameter and 5½ in. in length can be ground. 1 illustr.

D *Chcn Prs:Nj Psf/Chcz Prs:Nj Psf*

Photo-template profile grinding

Oscar Loeffler. *Metalworking Prod* 1961 Vol 105 (33) pp 57-60 (Aug)

7 illustr.

See also *Industr Diam Abstr* 1961 Vol 18 p A208 (Aug)

D *Axz Chch Pr/Bhbz Chc Pe Rnbz*

7th European Exhibition of Machine Tools: [tool and cutter grinder]

Cincinnati Milling Machines Ltd. *Mach Shop Mag* 1961 Vol 22 (9) pp 504-505 (Sep)

The Cincinnati No 2 tool and cutter grinder will be available with a wide range of attachments to demonstrate the grinding of a variety of cutters including slab mill, face mills, side and face cutters, end mills, reamers, gear hobs, *et cetera*. 2 illustr.

D *Al Chc Pr.27.3235*

Thread grinder uses automatic truing device

Anon. *Canad Mach* 1961 p 91 (Aug)

This machine has a capacity of 4 in. diameter and 10 in. dull thread length. The lead screw is for 5 to 80 pitch threads. 2 illustr.

D *Chcp Pr Psfz*

7 diameters in 7 seconds

Anon. *Grinding and Finishing* 1961 Vol 7 (8) p 31 (Aug)

Electric motor rotor shafts, requiring the grinding of seven diameters, were ground, it is claimed, at 50% higher rate on a Van Norman 2-C Diversimatic centreless grinder than by the previous method. Run-out is said to be held to less than 0.00015 in. and finish is held to 10-12 r.m.s. 2 illustr.

D *Chcc Pr Uqfc*

Tiny precision bearings boost guidance system reliability

R. O. Wirtemburg, Fafnir Bearing Co. *Machinery, NY* 1961 Vol 67 (12) pp 111-118 (Aug)

Describes the manufacture of precision miniature bearings used in modern aircraft and missiles. 12 illustr.

D *Ayz Qc*

The Watch Industry—Part 3

M. H. Kasfer. *Pera Bull* 1961 Vol 14 (8) p 233 (Aug); *Automatic Machining* 1961 pp 43-47 (May)

In this concluding article, the author describes some auxiliary machines and tool grinding equipment developed in the watch industry.

D *Al Chc.26:Tlb.25/Qc Tlb.26*

Honing receiver-borings for bearings. Das Honen von Aufnahmebohrungen für Walzlager

Anon. *Technica* 1961 Vol 10 (18) p 1142 (Sep) (In German)

It is possible to produce an accurate, long-lasting bearing-surface, it is claimed, using the Naget special honing machine and diamond honing tools.

B *Ay Chh Nqe Pr*

Grinding Inner Rotors

P. A. Sidders. *Machinery, Lond* 1961 Vol 99 (2545 pp 411-412 (Aug)

A Jones-Shipman type 1052/EF universal machine is used for grinding both types of inner rotor. A universal type C46/60LY2V abrasive wheel is employed and is run at 1,250 rev/min, which provides a surface speed of 5,000 ft/min. Solex gauging equipment is provided for checking the component after grinding. A similar set-up is employed for grinding two surfaces simultaneously on rear hubs.

E *Agz Chc Pr*

Grinding inner races for double-row taper-roller bearings
Soag Machine Tools Ltd, Juxon St, London SE 11. *Machinery, Lond* 1961 Vol 99 (2541) pp 187-188 (July 26)

Describes a typical application of the Wotan type S 313/12U hydraulic internal grinding machine. 2 illustr.
D *Chcn Prx*

Broach sharpening. Affilatura di una broccia
L. Orsini. *Macchine* 1961 Vol 16 (8) pp 845-851 (Aug) (In Italian)

8 illustr, 2 ref. *M* *Ale Chc*

The use of different clays as grinding wheel binders
K. Zimmermann and L. Burton-Banning. *Sprechsaal* 1961 Vol 94 (10) pp 245-258 (May); *Battelle tech rev abstr* 1961 Vol 10 (8) col 745 (Aug)

D *Ab Cs Urf*

Attachments for super finishing. Aufbaueinheiten für die Superfinish-Bearbeitung
K. Wieck. *Industrie-Anzeiger* 1961 Vol 83 (70) pp 133-134 (Sep) (In German)

Superfinish units can be used on machine tools for superfinishing of parts produced in small series. Operating methods and possibilities of using various units are described in detail. 3 illustr.
B *Pr:Chm Psc*

Reinforced grinding wheels
Norton Co. *Mach Tool Blue Bk* 1961 Vol 56 (8) p 220 (Aug)

The Cut-N-Saucer, a reinforced grinding wheel for weld grinding and light snagging, combines the advantages of a saucer shaped wheel with the convenience of a throwaway mount. It is available in 7 in. and 9 in. sizes to fit standard threaded spindles on portable grinding equipment. 1 illustr.
D *Az Chc Pez*

7th European Exhibition of Machine Tools : [cylindrical grinder]
Churchill Machine Tool Co Ltd. *Mach Shop Mag* 1961 Vol 22 (9) pp 503-504 (Sep); *Machinery, Lond* 1961 Vol 98 (2535) pp 1376, 1377 (June 14)

The Churchill model BW automatic plain cylindrical grinder features automatic loading, and has a controlled operating cycle which provides for automatic grinding of the component, gauging to size and automatic ejection. 1 illustr.

See also *Industr Diam Abstr* 1961 Vol 18 p A87 (Mar).
D *Chcm Pr.27.3235*

Automatic multi-spindle honing and measuring machine
Anon. *Maschinenwelt u Elektrotechnik* 1961 Vol 16 (8) p 395 (In German)

Nagel GmbH have developed a multi-spindle honing and measuring machine, which, it is claimed, produces the borings in a short machining time, and with a high degree of accuarcy. A measuring device ensures that the diamond tools are not damaged by workpieces which are too narrow.
B *Az Chh Nqe Prs/Az Cz Prs*

Brown & Sharpe Micromaster surface grinding machine
Brown & Sharpe Mfg Co. *Machinery, NY* 1961 Vol 67 (12) p 140 (Aug)

This 12 in. by 24 in. surface grinding machine has been specifically designed for use in tool and die shops where its table, which is wide in proportion to its length, can perform highly accurate die grinding.
1 illustr. *D* *Chcm Pr Ufd Wbd*

Royal Master precision centerless grinder
Royal Master Grinders Inc, Riverdale, NJ. *Machinery, NY* 1961 Vol 67 (12) p 168 (Aug); *Amer Mach* 1961 Vol 105 (15) p 137 (July)

Model CG-12 is 24 by 48 in. overall, grinds multiple diameter parts and intricately shaped profiles and can grind, it is claimed, a variety of materials such as tungsten carbide, stainless or carbon steel, glass or plastic, to a 0.0002 in. or 6 to 8 micro-in. finish. Wheel dressers can be either manually or hydraulically operated. 1 illustr. *D* *Bfcb Chcc Pr/ Bkc Chcc Pr/Bm Chcc Pr/Bp Chcc Pr*

Spline grinder modified for special internal work
The Gear Grinding Co Ltd, Shirley, Warwicks. *Tooling* 1961 Vol 15 (8) p 67 (Aug)

An 'Orcutt' 20 in. spline grinding machine was modified to enable it to grind internal longitudinal tracks of elliptical cross-section. The standard grinding wheel spindle quill was replaced by a new design internal grinding wheel, on the face of which an elliptical profile is produced with a special profile trimmer. 1 illustr. *B* *Chcn Pr*

7th European Exhibition of Machine Tools : [vertical honing machine]
Jones & Shipman Ltd. *Mach Shop Mag* 1961 Vol 22 (9) p 508 (Sep)

This company was showing a Micromatic model 761 vertical honing machine which they are now building in this country under an agreement with the Micromatic Hone Corp, Detroit, USA. The machine is particularly intended for the fine finishing of bores which are small in relation to their length. Using the maximum stroke of 15 in., bores up to 1½ in. can be honed and larger bores with a shorter length can also be accommodated. Automatic tool collapse coincides with the maximum stock to be removed and there is automatic compensation for stone wear. In addition the company will be showing a model 310 tool and cutter grinding machine and a model 1540 surface grinder. 1 illustr. *D* *Chc Pr.27.3235*

7th European Exhibition of Machine Tools : [profile tool and cutter grinder]
Sheffield Twist Drill & Steel Co Ltd. *Mach Shop Mag* 1961 Vol 22 (9) pp 514-515 (Sep)

A Dormer profile tool and cutter grinder which, it is claimed, can be used for form and radius grinding in addition to fulfilling the normal functions of a conventional universal tool and cutter grinder, will be exhibited by this firm. The machine is said to have very many applications. 1 illustr.
D *Al Chc Pr.27.3235*

Dual table grinder uses three-dimensional master
Frauenthal Division, The Kaydon Engineering Corp, Muskegon, Mich. *Grinding & Finishing* 1961 Vol 7 (6) p 54 (June)

Model 926 dual-table contour grinding machine uses a three-dimensional master on the first table to produce a duplicate on a second table. Said to produce a finish within ±0.0005 in., the machine was designed to grind Pyro-Ceram nose cones but may be adapted for other parts. 1 illustr. *D* *Az Chc Pr*

7th European Exhibition of Machine Tools : [universal hobber]
Dowding & Doll Ltd. *Mach Shop Mag* 1961 Vol 22 (9) pp 505-506 (Sep)

The new model V 10 universal hobber is suitable for gears up to 10 in. diameter and 7 D.P. 1 illustr.
D *Cfp Pr.27.3235*

Single head machine simplifies tool finishing

Leonard Precision Products Co, Grind-A-Lap Division, 9200 Bolsa Ave, Santa Ana, Calif. *Grinding & Finishing* 1961 Vol 7 (6) p 56 (June)

The single head Grind-A-Lap with quick change ring-type wheels, grinds and laps carbide, high speed steel and ceramic tools. Alnico magnets, set into the head, hold wheels firmly and accurately and permit instant changing with fingers only. The machine features a new type of grinding wheel, plated with a solid concentration of diamonds, which grinds cool and, it is claimed, never needs to be dressed. 1 illustr.

D *Al Bfcbd Chd Nv Pr/Al Bk Chd Nv Pr/Al Bl Chd Nv Pr*

Fortuna-Werke Spezialmaschinenfabrik AG, Stuttgart-Bad Cannstatt

Anon. *Maschinenwelt u Electrotechnik* 1961 Vol 16 (8) pp 389-390 (In German)

Fortuna display, a heavy 'special plunge-cut grinding machine' type KAE 500/1000 AR, dressed automatically by the 'Finiform' form truing device. The firm's grinding machines are equipped with 'Finibalnz', a mechanism for balancing grinding wheels, whilst the spindle is running. 2 illustr.

See also : *Industr Diam Abstr* 1961 Vol 18 p A9 (Jan) ; p A123 (May). *B* *Chc Pr Psf*

Centerless grinder cycles automatically

Royal Master Grinders Inc, 272 Highway 23, Riverdale, NJ. *Grinding & Finishing* 1961 Vol 7 (6) pp 60-61 (June)

Model CG-12-A can grind multi-diameter parts as well as balls of stainless or carbon steel, glass and plastic. It also grinds non-ferrous metals and ceramics. Special characteristics of this 30 in. and 54 in. grinder include high output and fast checking with both sides of the wheel accessible from operation position, wheel dressers which can be mounted on casters for mobility and a massive heat-treated alloy spindle with ball bearings lubricated for life. 1 illustr.

D *Az Bfcbc Chcc Pr/Az Bp Chcc Pr*

7th European Exhibition of Machine Tools : [cutter grinding machine]

Kendall & Gent Ltd. *Mach Shop Mag* 1961 Vol 22 (9) pp 509-510 (Sep)

A new cutter grinding machine, model FCG30, has been specifically developed for grinding the blades of inserted-blade milling cutters, either in the production of new tools or for the regrinding of cutters after use. Both carbide and HSS blades can be ground since the machine has an abrasive grinding wheel and a diamond wheel mounted on individual spindles. 1 illustr.

D *Al Chc Nv Pr.27.3235/Al Chc Pe Pr.27.3235*

7th European Exhibition of Machine Tools : [automatic camshaft grinding machine]

Landis Lund Ltd. *Mach Shop Mag* 1961 Vol 22 (9) p 510 (Sep)

Type DH automatic camshaft grinding machine is suitable for swinging work up to 5½ in. diameter and is available to take work up to 26 in., 30 in. or 40 in. between centres. A grinding wheel up to 1¾ in. wide can be used and this is dressed hydraulically.

D *Agz Chc Prs.27.3235*

Miniature internal grinder

Heald Machine Co, Worcester, Mass. *Mod Mach Shop* 1961 Vol 34 (1) pp 182-183 (June)

The Model 090A Centri-Matic miniature internal grinder incorporates a direct reading digital dial showing amount of remaining wheel life. 1 illustr.

D *Chcn Pr*

7th European Exhibition of Machine Tools : [surface grinding machine]

F. E. Rowland & Co Ltd. *Mach Shop Mag* 1961 Vol 22 (9) p 513 (Sep)

A 20 in. type HDD/C duplex surface grinding machine with two 20 in. diameter grinding disks will be shown by this firm. It is said that flatness and parellelism may be held to within 0.0004 in. and a surface finish of 12 to 14 micro-in. obtained with this machine. 1 illustr.

D *Chcm Pr.27.3235*

7th European Exhibition of Machine Tools : [cylindrical grinder]

Jones & Shipman Ltd. *Mach Shop Mag* 1961 Vol 22 (9) pp 507-508 (Sep)

The new model 1212 cylindrical grinder is hand operated and is intended for small batch work where a high degree of accuracy is required. It is claimed that roundness on dead centre grinding is within 0.00001 in. and with a live spindle workhead the error does not exceed 0.00005 in., surface finishes of 2 micro-in. CLA, or less, can also be obtained. 1 illustr.

D *Chd Pr.27.3235*

7th European Exhibition of Machine Tools : [automatic crankpin grinding machine]

Landis Lund Ltd. *Mach Shop Mag* 1961 Vol 22 (9) p 510 (Sep)

Type DH automatic crankpin grinding machine is intended for the production grinding of all types of crankshafts up to 42 in. long and with maximum swing of 16 in. A 36 in. diameter grinding wheel is used and the wheel dressing attachment dresses a full 90° radius on each corner of the wheel in addition to the wheel periphery. *D* *Agn Chc Pr.27.3235*

May SPN relief grinder

Anon. *Metalworking Prod* 1961 Vol 105 (35) p 94 (Aug)

Designed to allow a Diaform profile wheel dressing attachment to be mounted when required, the May SPN machine has compound movement of the spindle head for grinding the relief on cylindrical form and stepped cutters. *D* *Ab Cgf Psf*

Centerless high precision grinders

Anon. *Grinding and Finishing* 1961 Vol 7 (8) p 54 (Aug)

Improved design features of the new 1961 models of the Elgin Centerless high precision grinders include hydraulic diamond dressing : automatic plunge grinding : crush dressing to grinding wheel ; hydraulic trace forming to grinding and regulating wheels ; and oscillation of grinding wheel spindle. 1 illustr.

D *Chcc Pr:Nj Psf/Chcc Pr Psf*

Abrasive sawing machine

Collins Machinery Corp. *Mach Tool Blue Bk* 1961 Vol 56 (8) p 172 (Aug)

This machine, which employs all sizes of abrasive wheels up to 20 in., will cut up to 6 in. pipe and shapes, and make 4 in. solids on ferrous and non ferrous materials. 1 illustr. *D* *Bf Cej Pe Pr*

Universal tool grinding machine. Universal-Werkzeug-schleifmaschine

Anon. *Industrie-Anzeiger* 1961 Vol 83 (61) pp 1175-1176 (Aug 1) (In German)

This machine is claimed to be especially suited for the grinding of cutter-heads, milling cutters, reaming bits, tap drills, turning tools, face milling cutters with spiral cut, and gear hobbers, and capable of handling cutters with 2, 3, 4, 6, 8, 12, and 24 cutting edges. 4 illustr.

B *Ad Chc Pr/Alc Chc Pr/Ald Chc Pr*

7 inch grinder

Rockwell Manufacturing Co, Walker-Turner Div, 400 North Lexington Ave, Pittsburgh 8, Pa. *Mod Mach Shop* 1961 Vol 34 (3) pp 166-167 (Aug)

Advanced safety devices and convenient handling of odd-shaped and long stock are claimed as features of an improved 7 inch, ½ hp grinder. 1 illustr.

B *Chc Pr.2595*

Engis precision flat lapping machine

Engis Ltd, Gabriel's Hill, Maidstone, Kent. *Machinery, Lond* 1961 Vol 99 (2545) p 432 (Aug)

For this low-cost precision flat lapping machine a total of five close-grained cast iron plates of 8 in. diameter can be supplied. One of these plates has a turned surface and the remainder are hand scraped and then finish-lapped with different grades of the company's Hyprez diamond compound, and they have surface finishes ranging from 100 to 120 down to 1 to 3 micro-in. CLA. With these plates, work surfaces can be lapped with successively finer compounds, and it is stated that surface flatness down to one light band and finishes to 1 micro-in. CLA can be rapidly obtained. 1 illustr.

See also *Industr Diam Abstr* 1961 Vol 18 PA 210 (Aug). *E* *Chd Kmg Pr*

Drill point thinning machine

Farrel-Birmingham Co Inc, 565 Blossom Rd, Rochester, NY. *Mod Mach Shop* 1961 Vol 34 (1) pp 198-199 (June)

The machine will thin and centre the points of ¼ to 3 in. diameter drills in lengths up to 24 inches. In operation, the machine grinds a groove of the proper depth on each side of the web. This reduces the length of the flat between cutting edges, which has a tendency to thicken as the drill wears. The drill is reset for each groove so that its axis is always in the same position. 1 illustr. *D* *Albz Chcz Pr*

Polishing and deburring machine

Southwest Engng Co. *Metal Progress* 1961 Vol 80 (1) p 25 (July)

Three-dimensional, high-frequency, low-amplitude vibration is utilised in a Vibro-Energy finishing mill to polish and deburr metal, plastic and ceramic parts. 1 illustr.

B *Az Bf Cht Pr/Az Bl Chm Pr*

Bent and hook shank tap grinding fixture

R-O Mfg Co, Madison Heights, Mich. *Cutting Tool Engng* 1961 Vol 13 (6) p 59 (June)

A specialized tap grinding fixture designed for faster, more accurate sharpening of bent and hook shank taps is said to eliminate the necessity of removing nib type taps from the shank for flute grinding or relieving of chamfers. 1 illustr. *D* *Az Chc Pr Pscz*

New honing lap

Newtools Inc, Box 1, Amitville, New York. *Cutting Tool Engng* 1961 Vol 13 (6) p 57 (June)

A new honing lap is rated for lapping and stoning with diamond equivalency. It is recommended for handling all metals and materials. Four grits are available—180 for roughing, 220 for standard finishing, 360 for fine finishing, and 500 for superfine work. 1 illustr.

D *Bf Chd Nv*Bf Chd Pg*

LITERATURE REQUESTS

When applying for the loan of literature abstracted in this journal, please quote the title of the article, the name of the author, and the number of the page on which it appeared.

Universal cutter grinder

H. P. Preis, Engraving Machine Co, 657 US Highway 22, Hillside, NJ. *Mod Mach Shop* 1961 Vol 34 (1) pp 220-221 (June)

Capable of grinding any profile, the Model CG-21 is designed for sharpening single lip engraving and routing cutters. The universal cutter head is graduated from 0 to 90° for side angle, from 0 to 45° for side clearance, and from 0 to 35° for tip or end rake. Diamond impregnated wheels for tungsten carbide cutters are stocked in 100, 240 and 500 mesh. 1 illustr.

D *Al Bkcb Chc Nv Pr*

7th European Exhibition of Machine Tools: [gear finishing machine]

Churchill Gear Machines Ltd. *Mach Shop Mag* 1961 Vol 22 (9) pp 502-503 (Sep)

The Churchill model SAH 10 in. hard gear finishing machine has been developed for the finish honing of hardened gears to remove nicks and burrs and also to improve the surface finish. 1 illustr.

D *Ad Chm Pr.27.3235*

Add small, powerful electric hand grinder

Victor J Kreig Inc, PO Box 7, 1 Depot Plaza, Mamaroneck, NY. *Grinding & Finishing* 1961 Vol 7 (6) p 67 (June)

The Lesto GE/USL 33/1 electric hand grinder offers particular application in the manufacture of die-casting, stamping and tooling. Up to 1 in. grinding wheels may be used. 1 illustr. *D* *Al Chc Prd*

Tape-controlled roll grinder sizes, sequences automatically

Farrel-Birmingham, Ansonia, Conn. *Amer Mach* 1961 Vol 105 (16) p 75 (Aug)

1 illustr. *E* *Chc Prs Wpb*

USP 2,952,101 (Apr 8, 1958) **L. A. Carlson, Wood Conversion Co**

Drill sharpener and method

Hollow drills for making holes in fibreboard to form acoustic tiles pose certain problems when regrinding is required as these drills are generally long and slender. It is very difficult to maintain such drills with axes perfectly coaxial at the two ends of the drill. Therefore as a commercial tolerance a lateral offset of 0.006 is allowed, for a drill with a cutting end of 5/32 in. outside

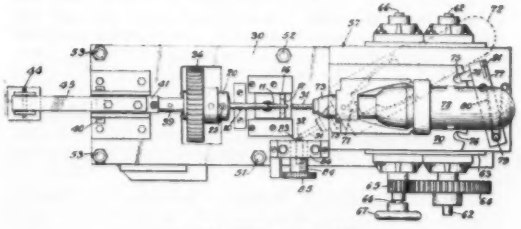


Fig 26. USP 2,952,101

diameter. When such a drill is mounted at its idle end for sharpening the eccentricity would create wobble. The drill is therefore positioned in the vicinity of its working end and its driven idle end is free to wobble. The arrangement is shown in Fig 26 with drill 11 positioned in anvil 16 with a V-recess 17. 31 is a grinding pencil to be trued by diamond 83. The truing position of the grinding device is shown in dotted lines. 11 claims, 4 illustr. Ref cited : 2 USP ; 1 GP.

J *Alb Chc Pr.545/Alb Chc.1456.545*

USP 2,952,948 (Apr 18, 1958) **P. F. Barker, Gleason Works**

Gear grinding machine

In order to increase the capacity range of gear grinding machines to grind gears of much smaller size than previously possible on a machine of given maximum capacity, the wheel head mounted on a cradle as usual and projecting forwardly is equipped with two pairs of spindles for carrying grinding disks of large and small diameter. Fig 27 shows the two spindles 15 for a large

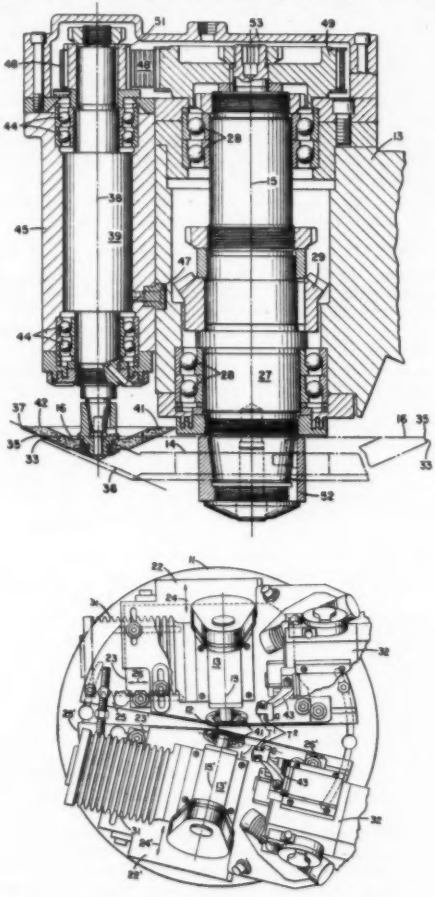


Fig 27 (top) and 28 (bottom). USP 2,952,948.

wheel 14 and 38 for a small wheel 41. Fig 28 shows the arrangement of the truing diamonds T_1 and T_2. As the periphery 37 of the smaller wheel 41 contacts the same line 36 that touches the periphery 35 of the larger wheel 14 the same truing unit and feed mechanism may be employed although a different arm 43 must be provided as the tools have to operate in different planes. 7 claims, 5 illustr. Ref cited : 4 USP.

J *Ad Chc Pr.545*

LITERATURE REQUESTS
Please quote the page number of the journal which contains the original reference, and the author and title of the article, in all cases.

FP 1,235,110 **R. G. Ellis, Micromatic Hone Corp** (Sep 11, 1958—USA)

Grinding elements. Eléments de rectification

In a tool for the honing of spherical surface a tubular abrasive stone is provided with a non-abrasive supporting sheel which is of sufficient strength and thickness to support the stone against cracking, and yet which evenly abrades or peels away with the abrasive material at the working surface there of during the honing operating. Fig 29 is an elevation of the tool partly in section and Fig 30 is a sectional plan view of the stone. The tool comprises a honing element 19 secured to a rod 15 positioned for axial movement in a drive shaft 13. The element 19 consists of a tubular abrasive stone 49 disposed within a non-abrasive supporting body 51. The abrasive material comprises silicon carbide grit bonded in a vitrified matrix, or silicon carbide or aluminium oxide grit bonded in a matrix of carbon and graphide. The body 51 is of moulded glass fibre reinforced alkyd or phenolic resin and consists of concentric supporting walls 55, 57. To facilitate break-

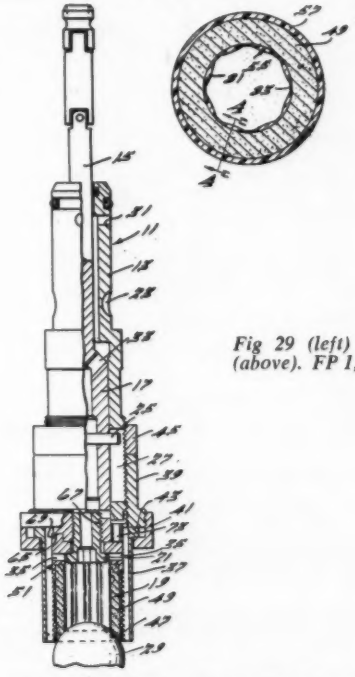


Fig 29 (left) and 30 (above). FP 1,235,110.

ing of the walls during the honing operation the inner wall 55 is formed of alternate relatively thick and thin portions whilst the outer wall is helically or annularly grooved. 11 claims, 5 illustr.

H *Pe.545*

DAS 1,096,238 (Dec 29, 1960) **S. Messerschmidt**

Ball grinding machine. Kugelschleifmaschine

The usual arrangement operates with two axially relatively to each other adjustable rotary disks with guide grooves for entry and discharge of the balls. It has been found that the diameter of balls to be ground in these machines is limited by the size of the grooves. A far greater range of ball sizes can be handled in such machines if the guide grooves are replaced by guide rails fixed to the disks. 1 claim, 2 illustr.

J *Ayz Chc Pr.545*

DAS 1,094,555 **P. F. Barker, Gleason Works** (Apr 18, 1958—USA)

Gear grinding machine, in particular for straight or helical gear wheels with greatly differing diameters. Zahnradschleifmaschine, insbesondere für gerad- oder schrägverzahnte Kegelräder mit stark abweichenden Durchmessern

See USP 2,952,948. 7 claims, 5 illustr.

J *Abmd Cg Psf:Chc Pr.545*

DAS 1,095,701 (Aug 14, 1956) **S. A. Boettcher, H. W. Gould, Crane Pkg Co**

Workpiece holder for lapping flat workpiece. Werkstückhalter zum Läppen flacher Werkstücke

The holder body with three adjustable legs is already known. A high precision adjustment is now made possible by making the leg parts angularly movable about axes parallel to the plane for carrying the workpieces. As shown in Fig 31 and 33 the holder consists of a three-cornered block 22. The holder is adjusted by

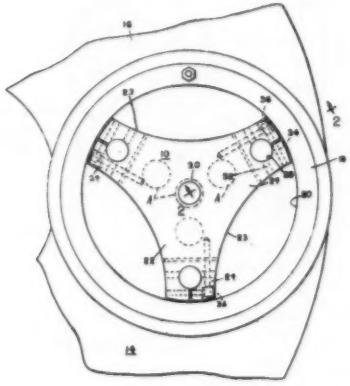
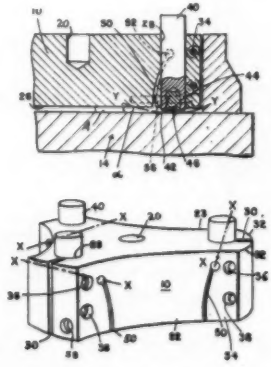


Fig 31 (above) and 32, 33 (below). DAS 1,095,701.



clamping the rods 40 as seen in Fig 32 in the appropriate position. These rods carry diamonds 44 resting on the lapping disk 14. The rod containing portions of the holder are partly separated from the central body by deep slots 50 which enable a slight angular movement of these portions by turning screws 56. 3 claims, 9 illustr. Ref cited : 3 USP.

J *Az Chd Psd.545*

DAS 1,097,854 (Feb 7, 1956—Denmark) **K. T. Grubb, B. Grubb, H. Struers chemiske Lab**

Polishing cloth for polishing metal surfaces with loose diamond dust, in particular for metallographic purposes. Poliertuch für das Polieren von Metalloberflächen mit losem Diamantstaub, insbesondere für metallographische Zwecke

Electrolytic polishing is for certain reasons not feasible in the case of materials containing non-metallic particles. Mechanical polishing, as *eg* with aluminium oxide, is often not satisfactory because of the development of an artificial structure through over-heating with subsequent deformation of the surface material which can only be avoided by extremely low pressure and corresponding long polishing time. It has been found that diamond dust can solve the problems if used on a cloth consisting of a thin woven textile layer over a backing of an impenetrable layer of a thermoplastic synthetic resin arranged on a second padding layer. 5 claims, no illustr. Ref cited : 2 GP ; 1 Swiss P ; 3 USP.

J *Az Bf Chm Km Pez.545*

DAS 1,098,332 (July 30, 1955—Japan) **J. Inoue**

Grinding tool for machining gear wheels with longitudinally curved teeth having an involute profile. Schleifwerkzeug zur Bearbeitung von Zahnrädern mit in ihrem Längsverlauf gekrümmten und Evolventenprofil besitzenden Zähnen

The tool belongs to the class of grinding wheels having a plurality of profiled grinding segments around their periphery. The characteristic feature of the wheel is a setting ring which with its conical thread engages equally threaded slide blocks carrying the grinding segments so that on turning the ring all segments advance or recede in the same manner. 2 claims, 6 illustr. Ref cited : 1 USP.

J *Ad Chc Pe.545*

DAS 1,099,386 (Dec 6, 1956—USA) **A. Fumia, Gleason Works**

Grinding machine for grinding the cutter head of a gear cutting machine. Schleifmaschine zum Abrichten eines Messerkopfes für eine Verzahnungsmaschine

The correct profile of a cutting edge which is composed of two faces forming a certain angle with each other can only be ground with an exactly profiled and adjusted grinding wheel. The machine is so designed that both operations can be carried out by semi-skilled operators. The truing diamond tool is guided in its rotary holder on a slideway with an angular bent, which coincides with the pivoted axis of the holder, lying in a plane which contains the axis of the grinding wheel and is disposed normal to the pivotal axis of the truing tool holder. Fig 34 illustrates the position of the truing device with diamond point T with regard to grinding wheel W whose profile W′ W² corresponds to the profile

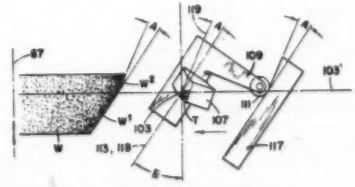


Fig 34. DAS 1,099,386.

of template 117. 11 claims, 26 illustr. Ref cited : 2 GP ; 2 DBP.

J *Ad Chc Pr Psf.545*

MACHINING PROCESSES AND DEVELOPMENTS

An experimental investigation of the electrolytic grinding process

R .R. Cole. *ASME Trans, Ser B, J of Engng for Industry* 1961 Vol 83 (2) pp 194-201 (May); *Battelle tech rev abstr* 1961 Vol 10 (7) col 684 (July); *Pera Bull* 1961 Vol 14 (8) p 233 (Aug)

Data are presented covering the effect of several variables on grinding rate for the electrolytic grinding process. The relative amount of material removal due to electrolysis and due to conventional grinding action was investigated. The Faraday current efficiency of the electrolytic part of the process was found to be near 100% to the extremely high current density of 700 amps/sq inch. This is thought to result from the scraping action of the wheel abrasive which prevents passivation of the work anode. Several phenomena of the process are explained on the basis of hydrogen gas pressure in the work wheel interface. A formula is presented for calculating the hydrogen reactions of the process. *D Chcr Pr.21*

Electrolytic grinding scores five ways

D. Fishlock. *Metalworking Prod* 1961 Vol 105 (35) pp 73-76 (Aug)

The use of the Agathon 125 SE electrolytic tool grinder by the Birmingham Tool and Gauge Co Ltd is described. The technique of electrolytic grinding in general and the modifications that had to be applied to this particular machine are detailed. Many advantages are claimed over conventional methods, including faster grinding rates, a big economy in diamond wheels, elimination of thermol clocking of carbide tips and achievement of a consistant surface finish of 10 micro in. or less. Selection of a suitable wheel (cathode) was difficult but a 5½ in diameter, ¼ in. wide Diagrit sintered electrolytic grinding wheel finally proved satisfactory. The wheel is dressed with silicon carbide, then electrolytically with hardened 18% Cr high speed steel, and is redressed every six weeks. 6 illustr.
*D Al Chc Nv*Al Chcr/Al Chcr Pr*

Investigating the use of ultrasonic methods for sharpening metal cutting tools

V. N. Verezub, A. E. Potapenko, E. A. Chistiakov. *Vest Mash* 1961 Vol 41 (3) pp 67-69 (Mar); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 820 (June) (Original in Russian)
D Al Bf Chc.1331.21

Tool fabrication and preparation by spark erosion

K. Ganser. *Bänder, Bleche, Rohre* 1961 (2) pp 51-55 (Feb); *Bull Brit non-ferr Met Ass* 1961 Vol 41 (385) p 348 (Aug) (Original in German)

Principles of the method. Description of 3 types of machines. Applications to steel and hard metal. 16 ref.
D Al Ceqmb.1456

Principles of spark machining

Gottfried Stute. *Elektrotechnische Zeitschrift* 1961 Vol 82 (10) pp 301-306 (May) (In German); *Battelle tech rev abstr* 1961 Vol 10 (8) col 799 (Aug)
D Ceqm.21

High-energy-spark forming

C. H. Wick. *Mach Tool Blue Bk* 1961 Vol 56 (8) pp 127-129 (Aug)

Describes equipment, applications, and some typical results with this process. 2 illustr.
D Ceqm

Electroshaping

Metachemical Processes Ltd. *Aircraft Prod* 1961 Vol 23 (3) pp 88-96 (Mar); *Bull Brit non-ferr Met Ass* 1961 Vol 41 (385) p 348 (Aug)

A more extensive account of the Sifco-Shape process mentioned in Note 1129/1961 of the latter journal. This was developed in USA for shaping rocket nozzles in W and Mo; turbine blades in Nimonic, stainless steel, *etc.* Metachemical Processes Ltd, of Crawley are now undertaking further development work, including reducing tooling costs, machining of small holes (diameters down to 0.020 in.), *et cetera.*
D Ceqhz.1456.342

How Timken grinds its carbide tools

The Timken Roller Bearing Corp, Canton, Ohio. *Cutting Tool Engng* 1961 Vol 13 (6) p 44 (June)

Grinding cost has been alleviated with the introduction of the electrolytic process; in one plant diamond grinding wheel use has been reduced, it is claimed, by a ratio of 7 to 1. 2 illustr.
D Chcr Nv.1451

Electrolytic finishing using 'Agathon' precision tool grinding machine. Elektrolytisches Bearbeiten auf 'Agathon' Präzisions-Werkzeugschleifmaschinen

Anon. *Technica* 1961 Vol 10 (17) pp 1087-1088 (Aug 18) (In German)

The process, the direct current generator, the special grinding wheel, and the electrolyte are described, and the advantages and most interesting applications of the method are discussed. 5 illustr.
B Al Chcw Pr:Chmk Psc

Ultrasonic machining. L'usinage par ultra-sons

F. Blasutti. *Mécan électr* 1961 Vol 45 (146) pp 83-84 (July-Aug) (In French)

By this method a tool of easily machinable material can be made to cut hard materials. The tool is made to vibrate at very high frequencies, and liquid containing abrasive is projected on to it. The abrasive softens the workpiece, and the tool cuts easily, with little wear, within a degree of precision of 0.05 mm, it is claimed. 2 illustr. *B Ceqr.1456*

Machinability of refractory powder-metal material with ultrasonic waves

A. A. Mukaseev & coll. *Vest mash* 1961 Vol 41 (3) pp 63-66 (Mar); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 757 (June) (Original in Russian)
D Ba Ceqr

Preparation of thin metal foils from ordinary tensile specimens for use in transmission electron microscopy

P. R. Strutt. *Rev sci Instrum* 1961 Vol 32 (4) pp 411-413 (Apr)

All the proceedures are electrolytic in order to avoid the introduction of mechanical strains. 6 illustr.
E Az Bf Ceqh

In search of the new : [metal cutting]

A. F. Filippov. *Blok agit (Len)* 1960 (23) pp 21-27; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 719 (June) (Original in Russian)
D Bf Ceg.1456

Electrolytic grinding carbide tools for automatics

Anon. *Pera Bull* 1961 Vol 14 (8) p 233 (Aug); *Automatic Machining*, 1961, May, pp 59-60, 3 illustr

Describes the use of an Anocut 300 amp unit.
D Chcr.1456.21

Electro-chemical machining of refractory alloys

W. B. Stephenson jun. *Mod Mach Shop* 1961 Vol 34 (1) pp 102-109 (June)

Describes process adopted in making a combination blade and bucket airfoil for a by-pass control test vehicle, when a method using a milling cutter proved uneconomical. 12 illustr.

D *Bfxz Ceqp.1456*

Using ultrasonic waves in making hard-alloy dies and moulds

V. Yu. Veroman. *Leningradskii dom nauchno-technicheskoi propagandy* 1960 (2) 22 pp. *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 821 (June) (Original in Russian)

D *Ax Bfx Qc Vwghb.21*

Swiss P 347,912 **J. Stanek, J. Kunc, Vyskumny ústav pre mechanizáciu a automatizáciu**
(Sep 15, 1955—Czechoslovakia)

Device for the automatic control of the feed and/or the pressure in electro-erosive cutting tools. Anordnung zur selbsttätigen Regulierung des Vorschubes bzw der Andrückkraft bei elektro-erosiven Schneidwerkzeugen

Cutting efficiency is highly dependent on the pressure between cutting tool and workpiece being permanently unaltered. Complex controlling devices are often employed which require a special current for an auxiliary voltage to maintain the desired ratio between a pressure producing magnetic coil and the resistance. The feed is further influenced by the varying frictional resistance of the tool slide. These drawbacks can be overcome by means of an electric dynamic system characterised by an exciting coil and a pressure coil both in parallel to the spark gap. It is further preferable to have a counter pressure device against the tool pressure which is a multiple of the varying mechanical resistances of the tool guiding means. 3 claims, 2 illustr.

J *Ceqmb Pr Wp.545*

FP 73,128 (Jan 23, 1958) **The British Oxygen Co Ltd**

Apparatus for erosion by the electric arc. Appareil pour l'érosion à l'arc électrique

In the main patent FP 1,181,788 a head assembly is described for an electric arc erosion cutter comprising a housing having a replaceable shielding nozzle 1 and a tungsten electrode 7 around which shielding gas flows. When cutting is effected an electric arc is established

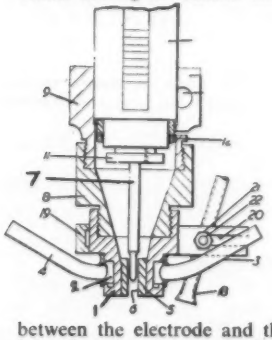


Fig 35. FP 73,128.

between the electrode and the workpiece. The present invention is characterised by the provision of an auxiliary nozzle 18 which is adjustably mounted on the nozzle 1 and which serves to direct a jet of fluid, such as compressed air or carbon dioxide, into the cut behind the electric arc during the cutting operation, so as to prevent the formation of dross or bridging material at the bottom edge of each side of the cut. 10 claims, 2 illustr.

H *Bf Ceqmb.1456.545*

FP 1,230,444 **C. P. Porterfield, Firth Stirling Inc**
(Mar 11 1957—USA)

Device for controlling the position of an electrode for apparatus for electroerosion machining. Dispositif de réglage de la position de l'électrode pour appareil d'usinage par électro-érosion

In spark machining it is important to maintain an optimum spark gap between the electrode and the workpiece at any instant. If the gap is closed by the tool advance or by the accumulation of discharged particles, the resulting short circuit current may damage the workpiece. If, on the other hand, the tool is at too great a distance from the workpiece, the applied voltage cannot ionize the dielectric and insufficient machining results. In the apparatus illustrated in Fig 36 a spark

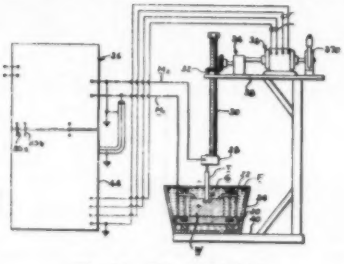


Fig 36. FP 1,230,444.

energy source 26 is connected to the electrode tool T and workpiece W. The tool T is driven through a feed screw 30 by an electric motor 36 connected to a spark gap spacing control 44 which provides a control voltage to motor. The control 44 comprises a magnetic amplifier, means for providing an adjustable bias signal for the amplifier for determining a desired normal operating voltage signal, and means including an integrator circuit adapted for connection with the workpiece and being connected to the amplifier for deriving a control signal for the amplifier from the spark gap voltage to correspondingly vary the output thereof so that the motor speed can be controlled. 17 claims, 4 illustr.

H *Ceqmb Ptc.545*

FP 1,236,462 **Ateliers des Charmilles SA**
(Oct 1, 1958—Switzerland)

Method of electrical machining. Procédé d'usinage électrique

The method, according to which an electric current is caused to pass between a workpiece and an electrode which move relatively to one another is characterised by directing between the electrode and the workpiece solid, electrically conducting particles of smaller dimension than the distance between the electrode and the workpiece. The particles form bridges which connect electrically the electrode and the workpiece and which are continually destroyed and reformed during relative movement thereof. At each bridge formation a high electric current passes between the workpiece and the end particle of the bridge in contact therewith and a small quantity of metal is transferred from the workpiece to the particle so that a high quality of machined surface is obtained together with a high speed of machining. Arcing between the workpiece and the electrode proper is prevented by applying a relatively low voltage there between. In the illustrative example the electrode is constituted by a rotary disk between which the workpiece a liquid containing the particles in suspension is passed. Alternatively, a pasty material containing the particles is applied between the electrode and the workpiece or the particles in powder form are carried by a current of air. 14 claims, 2 illustr.

H *Ceqm.1456.545/Ceqn.1456.545*

FP 1,232,874 **Carl Zeiss**
(1 & 2 Aug, 1958 ; 3 & 6 Sept, 1958—
Federal German Republic)

Apparatus for machining materials by means of a beam of electrified particles provided with means for optical observation. Appareil d'usinage de matériaux au moyen d'un faisceau de particules électrisées, comportant des moyens d'observation optique

The apparatus illustrated in Fig 37 comprises a vacuum vessel 12 in which is arranged a beam generating system consisting of a cathode 6, an anode 8 and a control electrode 7 and producing an electron beam 13 which passes through a diaphragm 14 and is focussed on to a workpiece 19 by an electromagnetic lens 17. The workpiece is viewed through a binocular microscope. Light from a lamp 34 is divided into two parts by a diaphragm 36. The two light beams are deflected by

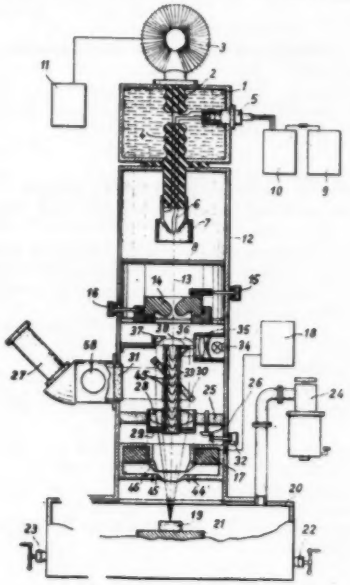


Fig 37. FP 1,232,874.

prisms 37, 38 and pass to an objective lens 28 through recesses in a mirror 30, the mirror serving to deflect light coming from the object 19 to pass through a window 31 of X-ray protective glass to the projection stage of microscope 27. The parts 28, 30 are bored to permit passage of the electron beam 13, the walls of the bores being protected from stray electrons by a ground tube 33. An apparatus using a monocular microscope is also described. The microscope may be connected with a television camera or with an image converter or be replaced by a microprojective device. 15 claims, 9 illustr. *H* *Ceqj Qd Wc.545*

Swiss P 349,717 (Jan 24, 1957) **W. Ehrlich, W. Ullmann, AG für industrielle Elektronik Agie**

Electro-erosive grinding method and device for carrying out this method. Elektroerosives Schleifverfahren und Einrichtung zu seiner Durchführung

Up to now the electroerosive grinding of a plane surface has been effected with a plane electrode. The disadvantage is the long duration of the grinding process because the permitted maximum of the current is independent of the size of the electrode. This disadvantage has been overcome by an electrode consisting of at least two part electrodes insulated from each other. The current is separately led to the different parts of the electrode and individually limited. This electrode can be moved relatively to the workpiece and an oscillating transverse movement may be superimposed to the first movement. A cylindrical electrode with electrically insulated annuli may be oscillatingly rotated around its longitudinal axis. The method can be used in combination with an electro-erosive grinding process. Electrode wear is reduced to a minimum. 20 claims, 11 illustr. *J* *Chcr Pr.545/Chcr.1456.545*

Swiss P 350,735 (July 5, 1957) **G. Wanninger, H. Kurth, AG für industrielle Elektronik Agie**

Device for mounting and driving the electrode of electro-erosion machine tools. Vorrichtung zur Halterung und zum Antrieb der Elektrode an elektroerosiv arbeitenden Werkzeugmaschinen

Electro-erosive methods require, in some cases that the tool is moved rapidly relatively to the workpiece, in other cases slowly. Furthermore the tool should be so mounted and driven that it can be moved vertically with or without rotation or rotated without vertical movement or that the movements may be superimposed. This depends on whether electro-erosive grinding with high speed rotation of the electrode is desired or *eg* the machining of dies requiring a very slow movement of the electrode, *etc.* In all cases rapid feed of the electrodes towards engagement with the workpiece should be possible. The electorde holder is characterised in that it is rotatable about its axis, axially movable by a feed spindle and independent of the drive spindle for the electrode holder. It is further provided with two drive systems which can be coupled through a gear change mechanism in such a manner that the feed spindle and the electrode drive spindle can selectively be rotated by either drive system with or without rotational coupling with the gear change mechanism. 7 claims, 5 illustr. *J* *Ceqm Pr Ptc.545*

DAS 1,094,547 (Aug 20, 1956) **H. Goetzeler, Siemens & Halske AG**

Method for the electrolytic removal of limited areas of electrically conductive or semiconductive material. Verfahren zum elektrolytischen örtlich begrenzten Abtragen von leitendem oder halbleitendem Material

The method is in particular preferable for drilling holes in germanium crystals. The workpiece is rotated

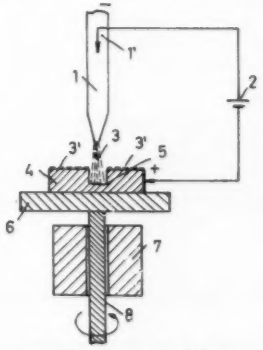


Fig 38. DAS 1,094,547.

at between 1000 and 10,000 rev/min so that the etching fluid discharged from the nozzle is thrown outwardly by centrifugal force as represented in Fig 38. Smooth uniform holes can be drilled. 8 claims, 3 illustr. Ref cited : 1 DBP ; 1 period. 1924.
J *Bde Cfbg.1456.545*

PRODUCTION, GRADING & RECOVERY OF ABRASIVE PARTICLES

Equipment for counting and sizing diamond particles

Anon. *Machinery, Lond* 1961 Vol 98 (2535) pp 1374-1375 (June)

The atricle describes some of the equipment and procedure employed by Diadust Ltd, one of the companies in the L. M. Van Moppes & Sons, Ltd Group, for counting and sizing diamond powder. A Casella automatic particle size analyser can automtically scan a specially prepared sample of dust, of sub-sieve size, and the counts obtained from three successive scanning runs are substituted for symbols in a simple equation, which when solved provides the number of particles contained in an area of 1 sq mm. 1 illustr.

D *Vgf*

Synthetic ruby abrasive reduces burn, ups wheel life in tool steel grinding

Simonds Abrasive Co, Tacony & Fraley St, Philadelphia 37, Pa. *Amer Mach* 1961 Vol 105 (16) p 103 (Aug)

RA Boralon abrasive is specially processed crystalline alluminium oxide. Combined with a new vitrified bond known as V8, it is used to make grinding wheels which are said to have toughness and friability. The wheels are recommended for grinding hard tool and die steels, including air-hardening and oil-hardening types and are said to be well adapted for the newer metals used in metal programmes.

E ***Pe Urg:Uqe***

Diamond lapping compounds

Anon. *Grinding and Finishing* 1961 Vol 7 (8) p 55 (Aug)

The new technique of crushing is said to give the diamond particles their maximum cutting efficiency, uniform shape and greater resistance to breakdown.

D *Chd Kmg*

A new method of testing abrasive grains II

H. Stotko. *Radex Rdsch* 1960 Vol 5 p 262; *Brit ceram abstr* 1961 (5) p 221A (May) (Original in German)

The behaviour of abrasive grains under dynamic stress during testing was studied, which assisted in the establishment of the optimum testing conditions.

B *Ba Cz*

Diamond powders

I. M. Brikman. *Standartizatsiia* 1960 Vol 24 (5) pp 39-41 (May); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 639 (June) (Original in Rusisan)

D *Km*

Units for checking technological processes in preparing abrasive material

B. S. Petukhov, IU. P. Rudakov. *Mashinostroitel'* 1961 (2) p 18 (Feb); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (2) p 318 (May) (Original in Russian)

D *Ba Cd*

TOOL PRODUCTION

Specialization in manufacturing metal cutting tools

V. L. Tiuniaev. *Mashinostroitel'* 1961 (1) pp 35-36 (Jan); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 719 (June) (Original in Russian)

D *Bf Ceg Pd Qc*

Hints on the manufacture of sintered carbide cutting tools to provide effective finish-grinding. Hinweise für die Neuanfertigung von Hartmetall-Drehstählen zum zweckmässigen Nachschleifen

Anon. *Technica* 1961 Vol 10 (17) p 1073 (Aug 18) (In German)

Hints are given on the design of sintered-carbide tips, so that the valuable diamond grinding wheel comes into contact only with sintered carbide during finish grinding.

B *Al Bkc Chc Nv/Pdc Qb*

Manufacture of metal cutting tool; guiding materials

A. D. Martynov. *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (2) p 297 (May) (Original in Russian)

Book, Gos nauchno-tekhn izd-vo mashinostroit lit-ry, Moscow, 1960. 172 pp.

[Not in library of Industrial Diamond Information Bureau].

D *Bf Ceg Pd Qc*

Eliminate primitive methods in manufacturing metal-cutting tools

V. P. Pavlusenko. *Mashinostroitel'* 1961 (1) p 36 (Jan); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 719 (June) (Original in Russian)

D *Bf Ceg Pd Qc*

August Heinrich Schmidt, Stuttgart-Feuerbach

Anon. *Maschinenwelt & Elektrotechnik* 1961 Vol 16 (8) pp 390-391 (In German)

The automatic saw-blade grinding machine type ASG 200, is able, thanks to the built-in regrinding system, and a diamond grinding wheel, to grind sintered carbide circular saws, it is claimed. 2 illustr.

B *Alfz Bkc Chc Nv*

Setting of diamonds in hard matrix bits

G. B. Dauncey. *Canad Min J* 1961 Vol 82 pp 67-69 (May); *Battelle tech rev abstr* 1961 Vol 10 (8) col 186 (Aug)

Findings have proved valuable and are offered as helpful suggestions to the Canadian industry.

D *F Lb Nhb.1456*

Conference on the quality of surfaces in the manufacture of machinery

V. E. Vainshtein. *Standartizatsiia* 196[illegible] Vol 24 (5) pp 52-53 (May); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 802 (June) (Original in Russian)

D *Pr Qc Unf.231.33*

BP 850,039 (June 25, 1958) **E. M. Holt, Hoy Carbides Ltd**

Abrasive tools

It is known how to bond diamond particles or the like to a metallic base by embedding them in a layer of metal around them. The process described in this specification is characterised by the use of a brazing metal as the bonding metal fused directly on to the base and to carbide particles after these particles have been distributed on the base. The assembly is heated *in vacuo* or in a reducing atmosphere above the melting point of the bonding metal. The brazing metal may be melted with a flux and the carbide particles scattered over the surface of the melted bond. Or the carbide particles and comminuted brazing metal are applied as a mixture, then heated until the bond is effected. 3 claims, 1 illustr.

J *Nv Urc.Rgd.545*

LITERATURE REQUESTS

Please quote the page number of the journal which contains the original reference, and the author and title of the article, in all cases.

BP 856,047 **S. Tolansky, D. W. A. F. Rudorff** (Jan 10 ; Nov 20, 1957)

Diamond tools

Diamond or diamond particles are employed which have been artificially etched so that at least the part of their surfaces in contact with the bonding material is pitted. The result is that the particles are more firmly held in the bonding material whether metallic, plastic or vitreous. The etching is effected as shown in Fig 39 after producing a nickel layer 3 by electrodeposition around the particles 1 held on a metallic auxiliary

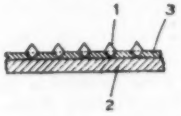


Fig 39. BP 856,047.

carrier 2. The carrier is then immersed in a bath of molten potassium nitrate. The final bonding layer is placed above layer 3. Layer 3 and the carrier 2 are removed by etching or an electrolytic process so that the unetched parts of the diamonds or particles protrude. 8 claims, 3 illustr.

J *Km Lfd N.545*

BP 864,402 **Philips Electrical Ind Ltd** (Nov 14, 1958—Netherlands)

Methods of mounting diamonds

A layer of titanium powder is applied from a suspension onto a diamond *eg* of 10 gs titanium powder in 15 mls of butanol and 15 mls of ethanol. After evaporation of the suspension agent the diamond is dipped into a conventional brazing metal, a molten silver-copper alloy (72% silver, 28% copper) in a vacuum. Before applying the titanium powder it is preferable to degrease the diamond with petroleum ether and superficially roughen it by heating to a temperature of 800° C in an oxygen containing atamosphere. 5 claims, no illustr.

J *F Ld N.545*

FP 1,230,978 **' Stella ' Schleifscheibenwerke Robert Buchner KG** (July 24, 1959)

Non-detachable fixing of abrasive bodies on backing disks. Fixation amovible de corps abrasifs sur un disque de support

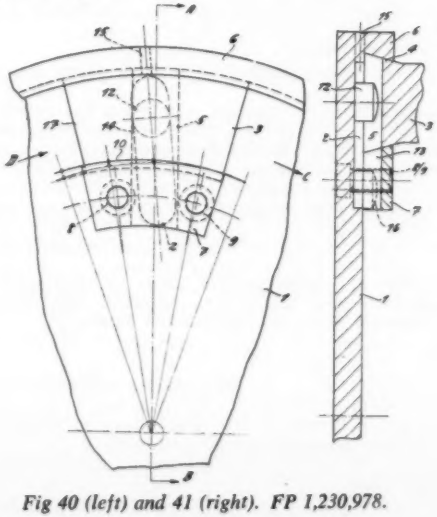


Fig 40 (left) and 41 (right). FP 1,230,978.

The invention relates to the rapid fixing and replacement of abrasive bodies on a supporting disk. Fig 40 is a plan view of part of the disk and of an abrasive body fixed thereto and Fig 41 shows a sectional view of the assembly and a plan view of the abrasive body. The abrasive body 3 is in the form of a segment having a root portion 4 dovetail in cross-section and wedge-shaped in the longitudinal direction, the direction of taper being opposite to the clockwise direction of rotation C of the disk 1. The root portion 4 of the body 3 to prevent their separation should the disk be rotated anticlockwise. The body 3 may be moulded or compacted integral with the portion 4 or cemented thereto. Other forms of abrasive bodies are illustrated. 13 claims, 5 illustr.

H *Pe.21.545*

DAS 1,094,178 (Sep 15,1954—USA) **P. W. Blackmer jr, Deutsche Norton GmbH**

Grinding wheel, in particular diamond grinding wheel with sintered metal bond. Schleifscheibe, insbesondere Diamantschleifscheibe mit gesinterter Metallbindung

The bond is a composition of 17 to 25% of a bronze containing preferably 18.5% tin the remainder being at least 99% ferritic iron containing not more than 0.15% carbon. The iron forms a porous framework filled with bronze. Just below 25 vol % diamond particles having a grain size of 225 (225 mesh/cm²) may be present in the mixture to be used for glass (lens) grinding. 2 claims, no illustr. Ref cited : 2 books, 1943 and 1949.

J *Nr UrC.545/Pe Urc.545*

DAS 1,097,788 (Oct 31, 1955—USA) **J. J. Sigman jun, W. S. Praeg, National Broach & Machine Co**

Honing tool for finishing gear wheels. Honwerkzeug zum Fertigbearbeiten von Zahnrädern

A gear honing tool must not be brittle like a grinding wheel because high speeds are required which cause high bending stresses as in ordinary gear wheels. A certain resilience can be obtained by using a composition of abrasive and synthetic resin in an

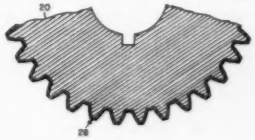


Fig 42. DAS 1,097,788.

arrangement as in thin grinding wheels without hollow spaces between abrasive particles and synthetic resin the particles being spaced within the hardenable synthetic resin. Epoxide resins which may be reinforced by glass fibres are suitable materials containing silicon carbide (Carborundum) as abrasive in the proportion of 1 : 1 over a core of steel or cast iron as shown in Fig 42 where the core is 20 and the honing layer 28. 5 claims, 6 illustr. Ref cited : 1 DBP ; 1 East German P ; 6 USP ; book 1949.

J *Ad Chm Pgk.545*

POWDER METALLURGY

The fifth All Union scientific technological conference on powder metallurgy

N. Z. Posdniak. *Vest mash* 1961 Vol 41 (1) pp 83-85 (Jan) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 757 (June) (Original in Russian)

D *Vwlb.231.33*

Fifth All Union technological conference of powder metallurgy

V. S. Rakovskii. *Metalloved i term obr met* 1961 (4) pp 63-64 (Apr); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 757 (June) (Original in Russian)

D *Vwlb.231.33*

Powder metallurgy (proceedings of International Conference, New York, June, 1960)

W. Leszynski. *Bull Brit non-ferr Met Ass* 1961 Vol 41 (385) pp 357-358 (Aug)

Book, Interscience Publishers, New York and London. 847 pp. Price $25.

Sponsored by Metal Powder Industries Federation (USA) and AIME: the numerous papers presented are grouped as follows:

'Mechanism of sintering' (13 papers); 'Dispersion strengthening' (6 papers); 'Technology and Methods' (11 papers); 'Materials and Applications' (12 papers). A subject index is provided.

[Not in library of Industrial Diamond Information Bureau]. *D* *Vwlb.52*

D *Vwlb.52*

MISCELLANEOUS

Possibilities of hard-partical impregnation of sliding surfaces

J Wells. *Machinery, Lond* 1961 Vol 99 (2538) pp 3, 53 (July 5); *Eng's Dig* 1961 Vol 22 (7) p 107 (July); *Metalworking Prod* 1961 Vol 105 (29) p 15 (July 19); *New Sci* 1961 Vol 11 (249) p 464 (Aug 24)

It is becoming increasingly important to provide guiding surfaces which will ensure extremely accurate linear movements during long periods of service. A high degree of uniformity of sliding motion, especially at very low speeds, is necessary to permit the required degree of accuracy of positioning by means of automatic control systems of various types. Developments in this field in recent years incorporated various lubricating systems. This paper* describes tests of a novel method of conferring the excellent friction and wear characteristics of diamond particles to sliding surfaces by impregnating them with a very large number of diamond particles. Lapped surfaces of hardened steel were rubbed together with a small amount of diamond dust between them, aviation paraffin being employed as a lubricant. Projecting sharp edges were removed by mutual abrasion to leave small pads of diamond above the surfaces. It is emphasised that the investigations are by no means complete, and that a great deal of further effort will be required before the findings can be applied commercially.

* Paper recently submitted to Institution of Mechanical Engineers, James Wells, B.Sc. 11 pp, 15 illustr.

D *Az Bfchz Chd Km Shj Ungd.21*

Materials : diamond bearings

Rolls-Royce Ltd, Derby. *Amer Mach* 1961 Vol 105 (15) p 73 (July)

About 0.00015 g of diamond powder per sq in. was applied to a bronze surface sliding on steel, the only lubricant being kerosene. Loading was three times the failing load of conventional lapped surfaces and the coefficient of friction was said to have been less than 0.001. Silicon carbide works almost as well as diamond powder.

See also *Industr Diam Abstr* 1961 Vol 18.

D *Ay Ceq Kmg*Ay Ceq Rgcz*

Diamond's vocation

O. Karyshev. *Tekh mol* 1961 Vol 29 (3) p 11; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (3) p 639 (June) (Original in Russian)

D *F.21*

Before the 7th European Machine Tool Exhibition, Brussels, 1961. Avant la E.E.M.O., Bruxelles 1961

Anon. *Mach Mod* 1961 Vol 55 (629) pp 75-99 (Aug) (In French)

Details are published of the machines most likely to be of interest at the Exhibition, most of which are novelties or innovations. Various illustr, to be cont.

B *Pr.27.3235*

The coming 7th European Machine Tool Exhibition in Brussels. Zur kommenden VII. Europäischen Werkzeugmaschinen-Ausstellung in Brüssel

J. Martin. *Maschinenwelt u Elektrotechnik* 1961 Vol 16 (8) pp 337-358 (June) (In German)

The exhibition, due to take place from the 3rd to 12th September, will include exhibits from W Germany, France, Italy, England, Holland, Austria, Switzerland, Sweden and Belgium. Machines to be on display at the exhibition are reviewed, and include turning, boring and micro-boring, milling, gear cutting, grinding, tool grinding and erosion machines, various tools and measuring devices. 36 illustr.

B *Pr.27.3235*

Swiss machine tools at the 7th European Machine Tool Exhibition. Schweizer Werkzeugmaschinen an der 7 EWA

Anon. *Technica* 1961 Vol 10 (18) p 1147 (Sep) (In German)

The article reviews Swiss machine tools on display at Brussels, including turning, boring and grinding machines. The firm of J. P. Petermann (Montier) display a special automatic machine designed for the watch making and high precision industry, Gebr Mägerle AG (Uster) display a production profiling and flat grinding machine incorporating fully automatic profiling and compensating devices, and Meyer & Burger AG exhibit an abrasive cutting machine which is claimed to slice quartz, glass, ceramics, *etc* as well as germanium and silicon by means of diamond impregnated disks.

B *Chc Pr.323:.27.3235*

The work of PERA

Anon. *Machinery, Lond* 1961 Vol 99 (2538) pp 42-43 (July 5)

Outlines the investigations that PERA has undertaken in the year ended Dec 31, 1960 *eg* into the performances of several makes of cylindrical grinders, measurement and analysis of sources of vibration in machine tools and production equipment, effects of various factors on the performance of ceramic cutting tools, *et cetera.* 2 illustr.

D *Ceg Pdd Uqe.21/Chcl Pr Uqe.21*

Addresses of representatives and manufacturers of products for machining, grinding and finishing cemented (sintered) carbides and oxides

Anon. *Cutting Tool Engng* 1961 Vol 13 (6) pp 38-40 (June)

D *Bkc Chc Pr.241/Bkc Chm Pr.241*

Directory of products for machining, grinding, and finishing cemented carbides and oxides

Anon. *Cutting Tool Engng* 1961 Vol 13 (6) pp 27-28, 30, 34, 36-37 (June)

D *Bkc Chc Pr.213 Bkc Chm Pr.213*

PUBLICATIONS RECEIVED

BOOK REVIEWS

Present findings of experimental research on 'The cutting of metals'. Données actuelles des recherches expérimentales concernant 'La coupe des métaux'

F. Eugène. Publications Estoup, 47 Rue du Château-des-Rentiers, Paris 8e, 1960. 156 pp, illustr, bibl. Price £2 6s 6d. (In French)

The book is divided into six chapters :

(i) the position of the problem of cutting metals, and generalities ;

(ii) Analytical study of cutting ;

(iii) Surface quality ;

(iv) Lubrication in cutting metals ;

(v) Present methods of measuring the machinability of metallic materials ;

(vi) Influence of metallurgical factors.

B *Bf Ceg.131.52*

Who makes machinery : Directory for buyers of machinery and apparatus, precision tools, machine parts and accessories

Verein Deutscher Maschinenbau-Anstalten e.V., Frankfurt (Main).

This publication comprises an alphabetical index of Products, Classified Register of Suppliers, and an alphabetical index of Manufacturers.

D *.241.572*

TRADE LITERATURE

Diamonds for industry

Dubbeldee Diamond Co Ltd, Lichfield, Staffs. associated with D. Drukker & Zn NV, Amsterdam, Holland. 32 pp, 5¼ × 8¼ in., illustr

The handbook presents a few facts concerning the industry which should be of interest to users of industrial diamonds, and has sections on rough diamonds and the sorting and grading of them, modern diamond tool manufacture, and descriptions and specifications of diamond tools.

B *N.57*

Metrology service at European Machine Tool Exhibition

Rank Precision Industries Ltd (Press release)

An international metrology service was operated by Taylor, Taylor & Hobson at the European Machine Tool Exhibition, Brussels. Instruments for the precision measurement of roundness, surface roughness, flatness, squareness and parallelism were demonstrated, including the Talysurf Model 105, described as a portable, inexpensive, and versatile means of measuring surface roughness, suitable for a variety of inspection and workshop applications, the Model 2 Talyrond, Talysurf Model 3, Talymin Series A, Micro Alignment Telescope, and Model D Pantograph Machine.

B *Vfd W.57*

PATENT LISTS

BRITISH

The Official Journal (Patents) 1961 (3781) (Aug 2)

877,773 GLEASON WORKS. Gear grinding machines.

877,709 CINCINNATI MILLING MACHINE CO. Shoulder grinding mechanism for a grinding machine.

877,715 CINCINNATI MILLING MACHINE CO. Grinding wheel thinning method and apparatus therefor.

877,744 UNGERER, F. Grinding machines.

The Official Journal (Patents) 1961 (3782) (Aug 10)

878,331 RUBERY OWEN & CO LTD. Manufacture of machine spindles.

The Official Journal (Patents) 1961 (3783) (Aug 16)

878,619 HOBSON LTD, H. M. Grinding machines.

878,496 GLEASON WORKS. Face mill cutters for gears and other toothed parts.

878,560 GLEASON WORKS. Machines for generating gears.

878,786 PITTSBURGH PLATE GLASS CO. Edge seaming apparatus.

878,620 HOBSON LTD, H. M. Grinding machines.

The Official Journal (Patents) 1961 (3784) (Aug 23)

879,415 SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ NV. Apparatus for drilling holes in underground formations.

UNITED STATES

Official Gazette 1961 Vol 768 (1-4) (July)

2,990,601 H. C. WAGNER, LABORATORIES EQUIPMENT CORP. Method of making refractory objects.

2,990,616 L. BALAMUTH, A. KURIS, CARITRON CORP. Ultrasonic cutting tool.

2,990,653 J. A. BROWNING, G. H. TENNANT CO. Method and apparatus for impacting a stream at high velocity against a surface to be treated.

2,990,656 A. H. TOMPKINS, VAN NORMAN INDUSTRIES INC. Automatically operable centerless grinder.

2,990,660 C. W. HATCHER, CONCRETE SAWING EQUIPMENT INC. Abrading machine.

2,990,664 G. R. CEPERO, PLASTIC CONTACT LENS CO. Method for finishing contact lenses.

2,990,828 M. HOERER, SUPER CUT INC. Rotary segmental saw with rim rigidifying and silencing means.

2,990,897 L. W. SHORT, DRILLING & SERVICE INC. Abrading element inset bit having improved circulating characteristics.

2,991,594 G. C. BROWN, R. N. RONEY, SHEFFIELD CORP. Machine device.

2,991,599 H. C. ELSE, MACHINERY SALES CO. Water stablized cutting wheel.

2,991,648 W. HANSSMANN, FRIEDRICH RAMBOLD KG. Apparatus for hardness testing.

2,991,673 A. F. M. VAN ROOIJ, NORTH AMERICAN PHILIPS CO INC. Device for grooving superfinished steel shafts.

2,992,007 R. J. BONDLEY, GENERAL ELECTRIC CO. Phonograph stylus.

2,992,519 C. J. PEARSON, INTERNATIONAL OPTICAL CO INC. Apparatus for surfacing and polishing optical glass and other articles.

2,992,520 P. KISH. Air floated grinder.

2,992,554 W. STOLK, W. C. HOLM ,MACHINE TOOL ELECTRIC CORP. Hardness sensing device.

2,992,900 H. P. BOVENKERK, GENERAL ELECTRIC CO. Method for producing improved diamond crystals.

2,993,417 B. CLAASSEN. Method and apparatus for machining the ends of the teeth of gear wheels and similar workpieces.

SOUTH AFRICAN

Official Journal 1961 Vol 1 (5-8) (July)

60/3342 A. G. MERRICKS, HARD METALS LTD. Rotary drilling bits.

61/1207 B. P. WARBURTON, PADLEY & VENABLES LTD. Rock-drilling bits for well-sinking and like purposes.

61/1251 W. F. WEST, MORE WEAR INDUSTRIES (RHODESIA) (PRIVATE) LTD. Means for protecting wearing surfaces.

AUSTRALIAN

Official Journal 1961 Vol 31 (22-24) (June-July)

234,116 J. HANSEN. Multiple band blade honing.

SWISS

Patentliste 1961 (12-13) (June-July)

355,235 W. ULLMANN, W. EHRLICH, AG FUR INDUSTRIELLE ELEKTRONIK AGIE. Method and device for electro-erosive grinding. (Add : 349,717).

355,236 W. ULLMANN, W. EHRLICH, AG FUR INDUSTRIELLE ELEKTRONIK AGIE. Method and device for the electro-erosive removal of material.

355,368 G. GLUCHOWICZ, ULVSUNDA VERKSTÄDER AB. Method and device for measuring control of grinding machines.

355,542 W. ULLMANN, AG FUR INDUSTRIELLE ELEKTRONIK AGIE. Device for carrying out an electro-erosive grinding method.

355,709 SUPER-CUT INC. Grinding wheel with a plurality of grinding faces.

FRENCH

Bulletin Officiel 1961 Vol 2 (30-33) (July-Aug)

1,268,656 A. L. LIVCHITS, M. J. BRISHMAN, A. T. KRAVETS, S. S. PODLAZOV, V. N. SOLOVOV, D. F. YAKHIMOVITCH, N. I. BLITSTEIN. Machine tool for machining by means of electric pulses the surface of electrically conductive materials in a liquid medium.

1,268,114 H. S. HALLEWELL. Method and apparatus for forming a predetermined profile on a workpiece by electro-erosion.

1,268,681 R. B. COLTEN, A. F. SCARPELLI, G. E. WANTTAGA, GENERAL MOTORS CORP. Machining by electro-erosion.

1,269,448 C. D. LA FLEUR, NORTON CO. Machine for polishing and honing workpieces such as crankshafts.

1,269,414 V. K. CHARAT, OSBORN MANUFACTURING CO. Abrasive and finishing tool.

1,269,451 C. KLINGSPOR. Fettling wheel.

1,269,104 INDUSTRIE DE PIERRES SCIENTIFIQUES HRAND DJEVAHIRJIAN SA. Method of producing a tubular body of synthetic stone and device for carrying out the method.

1,269,105 INDUSTRIE DE PIERRES SCIENTIFIQUES HRAND DJEVAHIRJIAN SA. Method of manufacturing a synthetic stone and device for carrying out this method.

1,269,106 INDUSTRIE DE PIERRES SCIENTIFIQUES HRAND DJEVAHIRJIAN SA. Method of making a revolving body, in particular a disk of synthetic stone and device for carrying out the method.

1,269,280 CO DE SAINT GOBAIN. Device for scoring glass.

1,269,187 W. TIRAPOLSKY, SOCIÉTÉ EUROPÉENNE DE TURBOFORAGE. Core drill for drilling earth.

1,269,648 CHURCHILL MACHINE TOOL CO LTD. Grinding machines.

GERMAN

Applications Open to Public Inspection

Patentblatt 1961 Vol 81 (30-33) (July-Aug)

1,111,752 FIRTH STERLING INC. Circuit arrangement for electro-erosion with delayed charging of the condenser.

1,111,980 R. HANSIS, MONTANWERKE WALTER AG. Grinding machine.

1,111,981 L. O. CARLSEN, W. C. CRITCHLEY, GLEASON WORKS. Truing device for grinding wheels.

1,112,379 F. CACRETT, E. BIRTCH, B. H. JOHNSON, MICHIGAN TOOL CO. Device for grinding a thread on a globoidal worm.

1,112,425 W. OSENBERG. Face grinding wheel with a grinding annulus consisting of individual hollow box-like face grinding elements.

1,112,922 G. S. BUTTERWORTH, CINCINNATI MILLING MACHINE CO. Method and device for the measuring control of tool grinders, in particular of centreless grinding machines.

Patents Granted

975,140 G. BRINKMANN, BETEILIGUNGS- UND PATENTVERWALTUNGSGES mbH. Safety device for machine tools.

975,164 E. W. MILLER, FELLOWS GEAR SHAPER CO. Employment of a gear wheel with convex or concave curved tooth flanks as a tool for finishing another gear wheel.

INDUSTRIAL DIAMOND INFORMATION BUREAU

Industrial Distributors (Sales) Ltd, 2 Charterhouse Street, London, EC 1.

LIST OF PUBLICATIONS, OCTOBER, 1961

***REPRINT SERVICE :** The Sep 1961 edition of the Reprint Service is now available and supersedes the 1958 edition. (Reprints 1s each post free.)

***LIST OF PERIODICALS—BIBLIOGRAPHY OF INDUSTRIAL DIAMOND APPLICATIONS :** Alphabetical, 8 pp, 7⅜ x 9¾ in., Sep 1955.

***LIST OF PERIODICALS IN THE INDUSTRIAL DIAMOND INFORMATION BUREAU LIBRARY AT MAY 31, 1958 :** Alphabetical, 8 pp, 7⅜ x 9¼ in. A list of periodicals available for loan from the Industrial Diamond Information Bureau Library. This does not replace *List of Periodicals* (above), which is a list of periodicals abstracted in *Industrial Diamond Abstracts*, many of which are not held by the Library.

***THE DIAMOND RESEARCH LABORATORY :** 16 pp, illustr, 11 x 9 in. Rev ed, 1956.

SELECTED BIBLIOGRAPHIES :

* **Truing of grinding wheels** (from 1910 to 1951). 39 pp, 7⅜ x 9¾ in. 3rd rev ed, Feb 1952.

* **Diamond as cutting tool for metals and non-metallic materials.** 24 pp, 7⅜ x 9¾ in. 2nd rev ed, Nov 1950. Name index, 1951.

Hardness and hardness testing (from 1937 to 1955). 118 pp, name index, subject index, 7⅜ x 9¾ in. 1955-56. Price 5s. 6d.

DIAMOND TOOL PATENTS (Patent Monographs)

IA : Machining metals and non-metallic substances, by P. Grodzinski, W. Jacobsohn. 2nd rev ed, 55 pp, 7⅜ x 9¾ in. Apr 1949. Price 10s.

II, IIs : Diamond abrasive wheels, by P. Grodzinski. 74 pp, 4 tables, name index, 7⅜ x 9¾ in. Aug 1948/49. Price 13s 6d.

III, IIIs : Truing of grinding wheels, by W. Jacobsohn. 133 pp, 82 illustr, name index, 7⅜ x 9¾ in. Dec 1948/49. Price £1.

IV : Polishing of gem diamonds, by W. Jacobsohn. 40 pp, 83 illustr, 1 table, name index, 7⅜ x 9¾ in. December, 1950. Price 12s 6d.

THE PRINCIPLES AND DESIGN OF A NUCLEAR RADIATION COUNTER WHICH USES A DIAMOND AS ITS DETECTOR, by W. F. Cotty. 18 pp, illustr, 7⅜ x 9¾ in. Oct 1956. Price 2s 6d.

DATA SHEETS FOR THE DIAMOND TOOL DESIGNER AND MAKER—Definition and designation of angles : Comparison of names for tool angles : Plane of chip flow : Clearance and rake angles : Minimum clearance for diamond boring tools : Economic layout of tool tips : Height position of turning tools : Accepted standards. 1945, reprinted Oct 1956. Price 5s.

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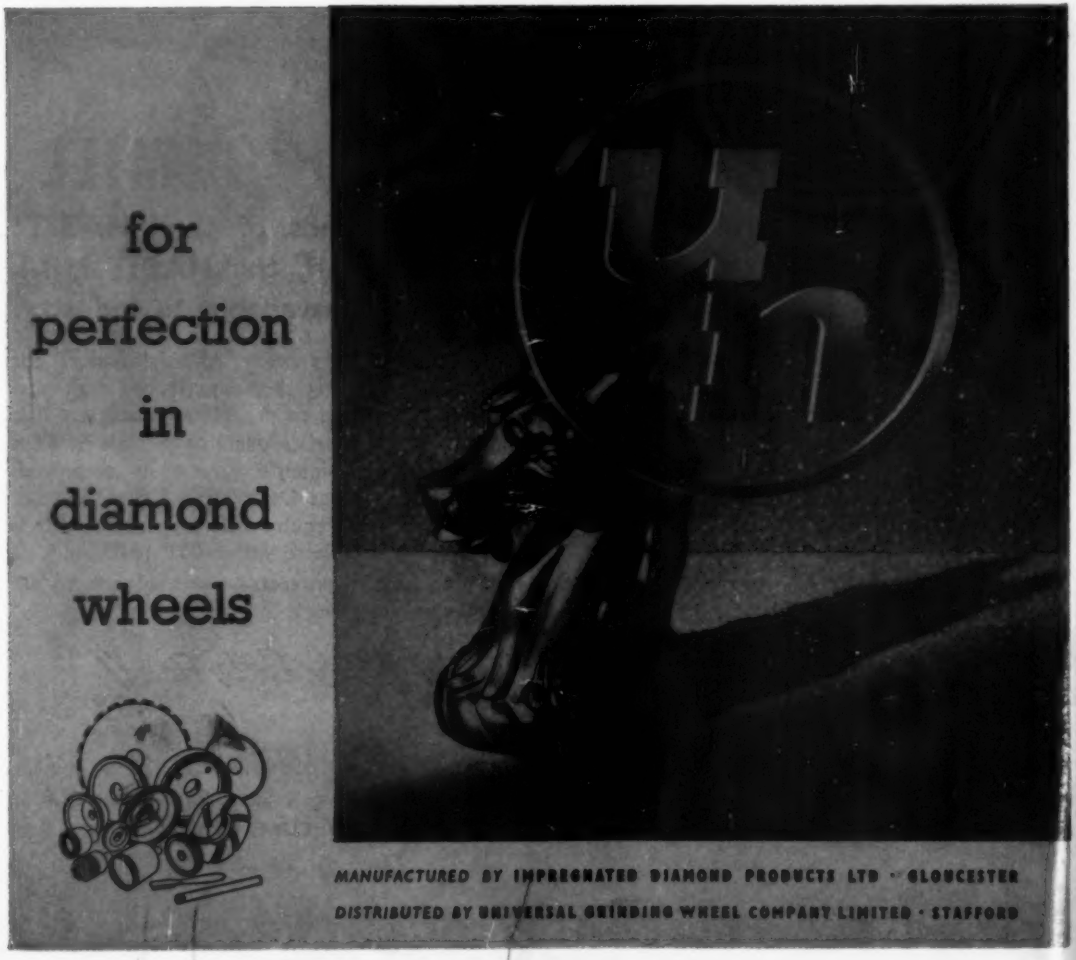
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